S/054/63/004/001/012/022
B101/B215

AUTHORS: Shul'ts, M. M., Peshekhonova, N. V., Parfenov, A. I., Ivanova, Ye. A., Petrova, V. N.

TITLE: Study of how alkaline earth oxides affect the electrode properties and chemical stability of lithium silicate glasses

PERIODICAL: Leningrad. Universitet. Vestnik, Seriya fiziki i khimii, no. 1, 1963, 104-114

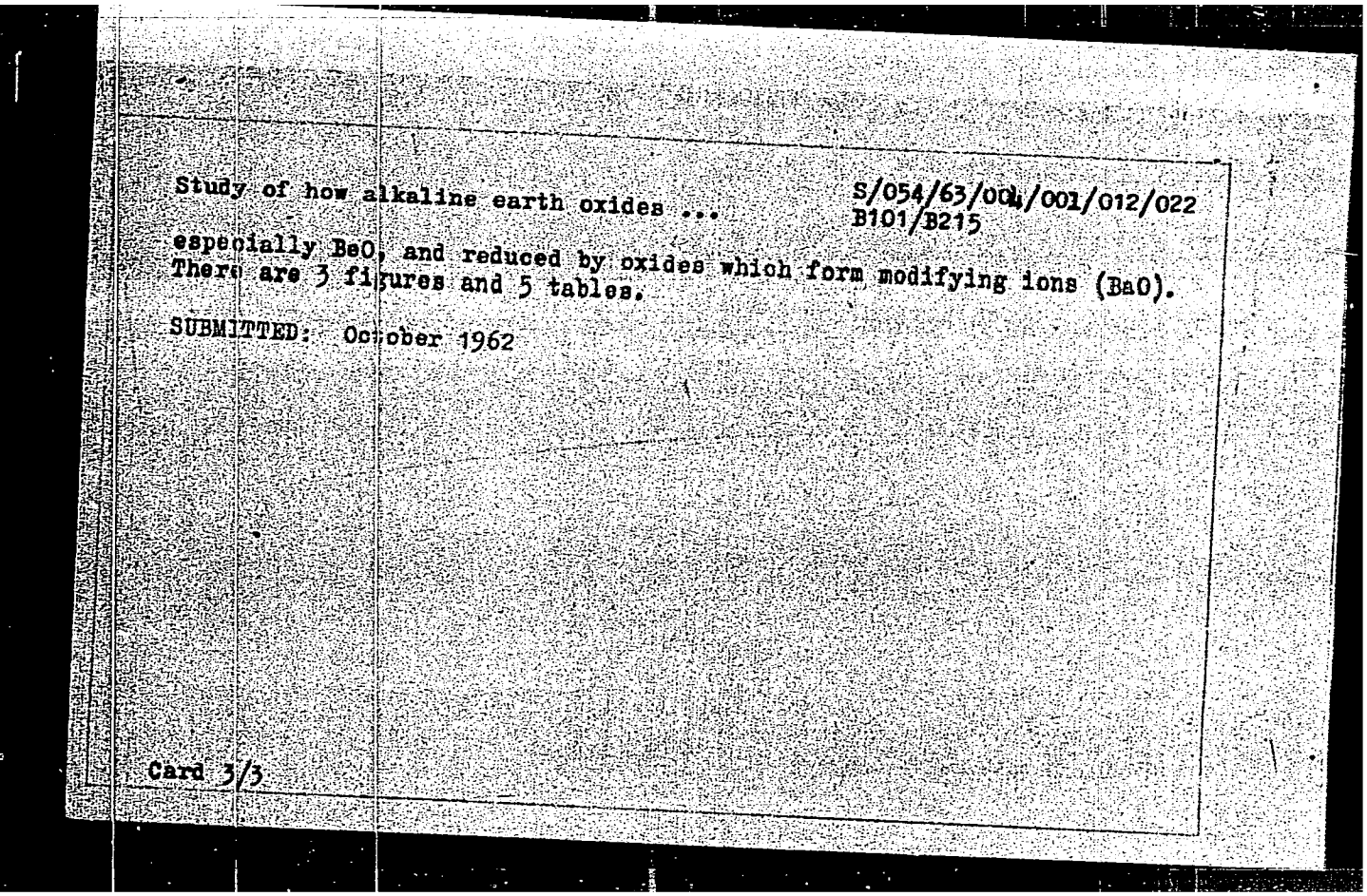
TEXT: Glasses containing 24, 27, or 30 mole% Li_2O and an addition of 0.20 mole% of BaO, CaO, MgO, or BeO were studied by plotting the curves E versus pH. Results: BaO shifts the upper limit of the H^+ function range by 0.1 - 0.3 pH units into the alkaline region. In some cases, also the lower limit of the H^+ function is shifted in positive direction. The exchange constant of Li - Ba glasses is somewhat lower than that of binary glass. CaO addition narrows the H^+ function range in the alkaline region, extends the transition range by ~1 pH unit, and increases

Card 1/3

the exchange constant, MgO has the same effect but much more intensively. The shift in the upper limit of the H^+ function caused by 15 mole% MgO at 27 mole% Li_2O is 3.3 pH units, but that due to 15 mole% CaO is only 1 pH unit. The shift caused by BeO is 2 - 3 pH units at no more than 2.5 mole%; at 15 - 20 mole% BeO, this shift in acid direction is 3-4 pH units. The effect on the exchange constants increases as follows: BaO < CaO < MgO < BeO. This is probably due to weaker H-bonds owing to the formation of strongly acid ionogenic groups. An addition of small amounts of BaO changes the stability of glass to H_2O but slightly, whereas 20 mole% BaO reduces its chemical stability. The stability is increased by up to 10 mole% CaO, and decreased by higher CaO concentrations; but it remains higher than that of binary glass. In an acid solution, 5 mole% CaO increasesthe stability, but at 10-20 mole% CaO the Li_2O leaches out intensively. MgO has a similar effect on the chemical stability. BeO increases the stability in H_2O and in acids.

Conclusion: The stability of the glass is increased by elements that form ionogenic groups in lithium silicate glasses such as MgO and

Card 2/3



Study of how alkaline earth oxides ... S/054/63/004/001/012/022
B101/B215

especially BeO, and reduced by oxides which form modifying ions (BaO).
There are 3 figures and 5 tables.

SUBMITTED: October 1962

Card 3/3

S/054/63/004/001/014/022
B101/B215

AUTHORS: Parfenov, A. I., Shul'ts, M. M., Nekrasova, T. N., Polozova, I. P.

TITLE: Electrode properties and chemical stability of lithium silicate glasses containing rare earth oxides of yttrium oxide

PERIODICAL: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 1, 1963, 126-134

TEXT: This is a report on the study of glasses belonging to the systems $Li_2O - Nd_2O_3 - SiO_2$, $Li_2O - CeO_2 - SiO_2$, and $Li_2O - Y_2O_3 - SiO_2$. The curves E versus pH were plotted at room temperature in the pH interval -0.5 - 14 and at 95°C in the pH interval -0.5 - 12 in solutions with a constant 3 N concentration of Li^+ or Na^+ ions. In addition, the stability of the glass to H_2O or 0.1 N HCl was determined at 100°C. Results: (1) Addition of rare earth oxides or Y_2O_3 shifts the total H^+ function

Card 1/2

range toward more acid values. (2) A small content of rare earth oxides or Y_2O_3 (up to 5 mole%) causes an intensive shift which becomes comparatively small as the content of rare earth oxides or Y_2O_3 is increased. (3) The shift increases the higher the number of the rare earth element in the periodic system i. e. the smaller its ion radius. The exchange constants K_{HLi} increase. (4) The effect of Y_2O_3 is more intensive than that of rare earth oxides. (5) The stability of glass to H_2O and 0.1 N HCl is increased by rare earth oxides and Y_2O_3. There are 4 figures and 7 tables.

SUBMITTED: October 1962

S/054/63/004/001/016/022
B101/B215

AUTHORS: Shul'ts, M. M., Parfenov, A. I., Panfilova, N. P.

TITLE: Effect of zirconium dioxide on the electrode properties and the chemical stability of alkali silicate glasses

PERIODICAL: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 1, 1963, 143-148

TEXT: Silicate glasses containing 27 mole% Li_2O and 0 - 9 mole% ZrO_2 were studied by plotting the curves E versus pH at room temperature and at 95°C in a 3 N alkaline solution or 3 - 20 N H_2SO_4. Furthermore the chemical stability to H_2O or 0.1 N HCl at 100° was tested. Results: Even 3 mole% ZrO_2 shifts the upper limit of the H^+ function considerably towards more acidic pH values. At the same time the region of transition from H^+ to the metal function is extended. The exchange constants increase by 2 orders of magnitude at room temperature and by 4 orders

Card 1/2

of magnitude at 95°C. In sulfuric acid, even 0.5 mole% ZrO_2 shifts the H^+ function towards acid pH values; at 9% ZrO_2 the lower limit of the H^+ function in 20% H_2SO_4 is pH = -2. ZrO_2 increases the stability of glass to alkali and acid. The glass - acid interaction is attended by leaching out, but in alkaline solutions the glass components are dissolved at the same ratio as when contained in the glass. Conclusion: A ZrO_2 addition leads to the formation of groups having H^+ bonds of different strengths. Besides the weakly acid $\left[SiO_{4/2}\right]H$ groups, also strongly acid ionogenic $\left[RO_{6/2}\right]^{2-} 2H^+$ groups are formed. There are 4 figures and 4 tables.

SUBMITTED: October 1962

Card 2/2

S/054/63/004/002/018/022
B101/B215

AUTHORS: Shul'ts, M. M. Parfenov, A. I., Chen Tieh-yü, Bondarenko, T. G., Mekhryushev, Yu. Ya.

TITLE: Electrode properties of glasses of the oxide system Li_2O - Cs_2O - La_2O_3 - SiO_2

PERIODICAL: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 1, 1963, 155-160

TEXT: Glasses of the system Li_2O - Cs_2O - La_2O_3 - SiO_2 containing 24, 27, 30, or 33 mole% Li_2O, 0-9 mole% Cs_2O, and 0-9 mole% La_2O_3 were examined as to their electrode properties in order to test their applicability for pH measurements. They were compared with glasses of the systems Li_2O_3 - SiO_2, Li_2O - Cs_2O -SiO_2, and Li_2O - La_2O_3 - SiO_2. The curves E versus pH were plotted at 20 and 95°C in 3 N alkali solution. Results: Increase in Li_2O content from 20 to 30% does not affect the limits of the H^+ function at 20°C, but at 95°C they become

Card 1/2

narrower. Substitution of Cs_2O for part of SiO_2 reduces the alkali deflections and increases the acid deflections of the curve E versus pH, reducing the chemical stability. Addition of La_2O_3 has the opposite effect. The simultaneous addition of Cs_2O and La_2O_3 has an additive effect. The limits of the H^+ function range are shifted in the alkaline region (effect of Cs_2O) as well as in the acid region (effect of La_2O_3). At 20°C, a maximum of the upper limit of the H^+ function range is reached at a content of 3 - 5% Cs_2O and 5-8% La_2O_3 in the glass. At 95°C, however, glasses containing more Cs_2O than La_2O_3 have a maximum H^+ function range. Cs_2O is not be recommended for electrode glasses as it increases the electrode resistance and decreases the chemical stability. 3-6% La_2O_3 is favorable as it increases the stability and stabilizes the electrode potential. There are 5 figures and 1 table.

SUBMITTED: October 1962

Card 2/2

S/054/63/004/003/020/022
B101/B215

AUTHORS: Parfenov, A. I., Shul'ts, M. M., Kochergina, N. N., Ivanov, V. P., Yevnina, S. B., Kalmykova, L. P., Ageyeva, Ye. D.

TITLE: Electrode properties and chemical stability of a number of multicomponent glasses

PERIODICAL: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 3, 1963, 162-166

TEXT: Lithium silicate glasses containing additions of Cs_2O, BaO, La_2O_3, TiO_2, ZrO_2, and ThO_2 were studied by plotting their E versus pH curves in alkaline media at 95 and 150°C in order to extend to strongly alkaline media, and to temperatures above 100°C, the applicability of glass electrodes for pH measurements. Results: Glasses containing up to 4% Cs_2O and 2-6% BaO have the widest H^+ function range in alkaline media at 95°C. Additions of TiO_2, ZrO_2, or ThO_2 up to 2% do not change

Card 1/2

Electrode properties and chemical ...

the upper limit of the H^+ function in alkali, but improve the electrode characteristics in a strongly acid medium at high temperatures. If these additions exceed 2%, the upper H^+ limit is shifted toward lower pH values. In 1 N NaOH at 150°C, the chemical stability of glasses was found to decrease at an increasing content of Cs_2O and BaO. The stability is increased by adding TiO_2, ZrO_2, and ThO_2, and decreased by raising the temperatures. The life of electrodes at 150°C was only 1/50 that observed at 95°C. There are 2 tables.

SUBMITTED: October 1962

Card 2/2

MEL'NIKOV, N.N.; ZETKIN, V.I.; LIBMAN, B.Ya.; SOKOLOVA, Ye.M.; ZAKHAROV, Ye.V.; PARFENOV, A.I.; TRUNOV, P.P.; GOLYSHIN, N.M.

Organic fungicides as substitutes for copper-containing preparations. Khim. prom. no.10:28-30 O '61. (MIRA 15:2)
(Fungicides)

PAVLENOV, A.I.; KLIMOV, A.F.; MAZURIN, O.V.

Electric conductivity of glasses of the system $Li_2O - Cs_2O - SiO_2$.
Vest.LGU 14 no.10:129-135 '59. (MIRA 12:6)
(Glass--Electric properties)

AUTHORS: Shul'ts, M. M., Parfenov, A. I. SOV/54-58-3-14/19

TITLE: The Investigation of the Behavior of Glass Electrodes With Sodium Metal Function in Water-Alcohol Solutions of Sodium Chloride (Issledovaniye povedeniya steklyannykh elektrodov s natriyevoy funktsiyey v spirto-vodnykh rastvorakh khloristogo natriya)

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1958, Nr 3, pp 118-125 (USSR)

ABSTRACT: In the present work the authors investigated the influence of non-aqueous solvents upon the behavior of glass electrodes with sodium metal function and explained the possibilities of their practical application in these media. The electrodes were made of glass of the following composition (in molar percent): Glass Nr 11: Na_2O - 25 %, B_2O_3 - 11 %, Al_2O_3 - 3 %, SiO_2 - 61 %; Glass Nr 13: Na_2O - 25 %, B_2O_3 - 9 %, Al_2O_3 - 5 %, SiO_2 - 61 %. In aqueous solutions of sodium chloride these glass types exhibit a sodium function at pH = 4 and above. Experiments with saturated sodium chloride solutions were

Card 1/4

The Investigation of the Behavior of Glass Electrodes With Sodium Metal Function in Water-Alcohol Solutions of Sodium Chloride

carried out. No specific influence of the solvent upon the behavior of the glass electrode was observed. This fact permits to assume that such electrodes can be employed in the investigation of the thermodynamic properties of sodium salts in various organic water-diluted solvents and in organic solvents of an alcohol type. Furthermore the behavior of the glass electrodes in water-methanol solutions of sodium chloride was examined. In the first series of experiments the behavior of glass and of sodium amalgam electrodes in water-diluted methanol as solvent was compared. In the second series of experiments changes of the chemical potentials of solutions of sodium chloride in little water-diluted methanol were investigated by means of glass electrodes. The results found by means of glass and amalgam electrodes agree well with each other. Glass electrodes with a metal function exhibit certain advantages as compared to amalgam electrodes: They render possible the measurement of the salt activity and of alkaline metal bases even in weakly acid solutions. Measurements can be performed in more diluted solutions than with amalgam electrodes. Glass electrodes with metal function can be employed in the salt

The Investigation of the Behavior of Glass Electrodes With Sodium Metal Function in Water-Alcohol Solutions of Sodium Chloride

solutions of various metals in a relatively wide range of their relative content. The activity of alkaline metal compounds can be determined much easier by means of glass electrodes than by means of amalgam electrodes. Furthermore the change of the chemical potentials of sodium chloride in the system H_2O-CH_3OH-NaCl at different concentrations of the components was investigated. As table 6 shows the substitution of water by methyl alcohol in a number of solutions with constant percentage leads to an increase of the chemical potential of sodium chloride. This seems to be reflected also by the influence of alcohol on the solubility of sodium chloride in the system, i.e. a weaker solubility in the case of higher alcohol content in the solvent. The authors express their gratitude to B. P. Nikol'skiy for valuable suggestions. There are 6 tables and 17 references, 12 of which are Soviet.

ACCESSION NR: AT4040548 S/0000/64/000/000/0106/0115

AUTHOR: Nikol'skiy, B. P.; Shul'ts, M. M.; Peshekhonova, N. V.; Parfenov, A.I.; Mazurin, O. V.

TITLE: Lithium-cesium-lanthanum silicate electrode glass for pH determinations

SOURCE: Soveshchaniye po khimii redkikh elementov. Leningrad, 1961. Khimiya redkikh elementov (Chemistry of rare elements); doklady* soveshchaniya. Leningrad, Izd-vo Leningr. univ., 1964, 106-115

TOPIC TAGS: glass, electrode glass, pH measurement, hydrogen electrode, silicate glass, rare earth oxide, glass electrical conductivity, lithium oxide, cesium oxide, lanthanum oxide

ABSTRACT: The authors investigated the effect of the oxides of Li, Cs and La on the limits of linearity of the relationship between pH and electrode potential, as well as the specific electrical conductivity and chemical stability, of electrodes made from glass formed by oxide systems of progressing complexity: Li_2O - SiO_2,

Card 1/2

ACCESSION NR: AT4040548

Li_2O - Cs_2O - SiO_2, Li_2O - CaO(BaO) - SiO_2, Li_2O - La_2O_3(Nd_2O_3) - SiO_2, Li_2O - Cs_2O - La_2O_3 - SiO_2, Li_2O - BaO - La_2O_3 - SiO_2, Li_2O - Cs_2O - CaO - BaO - La_2O_3 - SiO_2, and so forth. The electrical conductivity of binary glass was found to be enhanced by additions of up to 12 mol % Cs_2O; it drops sharply beyond this point to exhibit the well-known Mueller and Markin's effect. Additions of La or Nd oxides to Li_2O - SiO_2 glass shift the lower limit of linearity mentioned above into the acid region and appreciably increase the chemical stability. Li_2O - La_2O_3 - SiO_2 glass systems may be used for measuring pH values as low as 2. To establish the optimal ratios of Cs, Ba and La for glass with a wide range of linearity between pH and electrode protential, a series of Li_2O (24, 27, 30, 33 wt. %) - Cs_2O (0 - 9%) - La_2O_3 (0-9%) - SiO_2 and Li_2O (27%)-BaO(0-9%)-La_2O_3(0-9%)-SiO_2 systems was studied. Glass with 3-5 mol% Cs_2O and 5-8 mol% La_2O_3 was found to possess the highest upper limit of linearity. Orig. art. has: 5 figures and 4 tables.

ASSOCIATION: none

SUBMITTED: 21Jan64 DATE ACQ: 28May64 ENCL: 00

SUB CODE: IC, MT NO REF SOV: 014 OTHER: 001

Cord 2/2

ACCESSION NR: AT4040547 S/0000/64/000/000/0096/0105

AUTHOR: Shul'ts, M.M., Peshekhonova, N.V., Belyustin, A.A., Parfenov, A.I., Bobrov, V.S.

TITLE: Electrode properties of alkali silicate glasses containing the oxides of gallium, indium, titanium and zirconium

SOURCE: Soveshchaniye po khimii redkikh elementov. Leningrad, 1961. Khimiya redkikh elementov (Chemistry of rare elements); doklady* soveshchaniya. Leningrad, Izd-vo Leningr. univ., 1964, 96-105

TOPIC TAGS: glass, silicate glass, electrode behavior, silicate glass electrical property, rare earth oxide, alkali silicate glass, gallium oxide, indium oxide, titanium oxide, zirconium oxide

ABSTRACT: After a theoretical review of the electrode properties of various glasses and the relationship between the EMF of an Ag AgCl, HCl glass buffer KCl, Hg_2Cl_2 Hg cell and pH, the authors describe the effect of the addition of various amounts of rare oxides to lithium-silicate, lithium-aluminium-silicate, sodium-aluminium-silicate, and sodium-barium-aluminium-silicate glasses. In glasses of

Card 1/3

ACCESSION NR: AT4040547

the series of 24% Li_2O-X% R_2O_3 - (76-X)% SiO_2, when R=B, Al, Ga, in order to obtain the same effect it is necessary to incorporate more Ga_2O_3 than Al_2O_3 and more B_2O_3 than Ga_2O_3, which means that the effect of Ga_2O_3 on the electrode properties is between the effects of B_2O_3 and Al_2O_3. Analogous results were obtained with glasses containing 27 and 30% LiO_2. In glass of the system 22% Na_2O-X% Ga_2O_3-(78-X)% SiO_2, added gallium acts as a glass former and to some extent as a modifier. In a system containing 22% Na_2O-X% In_2O_3 - (78-X)% SiO_2, it was observed that the deviation from the hydrogen function increased with an increase in In_2O_3, but was less than with Ga_2O_3. In glass of the system 22% Na_2O - 4% R_2O_3 - 74% SiO_2 (R=B, Al, Ga and In), the effect of the R_2O_3 oxides on the electrode behavior of sodium silicate glasses decreased in the order Al > Ga>B>In, as in the lithium silicate glasses. This order is characteristic for glasses when $[R_2O_3]/[Na_2O] < 0.3$. If $0.3 < [R_2O_3]/[Na_2O] < 1$, the order is different: A > B > Ga > In; while if $[R_2O_3]/[Na_2O] > 1$, the order is Ba > Al > Ga > In. In the system Na_2O-TiO_2-SiO_2 where Na_2O = 16-22 mol.%, the effects were characteristic for the oxides of glass formers, and analogous data were obtained with some LiO_2-TiO_2-SiO_2 systems. Relatively small amounts of TiO_2

Card 2/3

ACCESSION NR: AT4040547

produced differentiation with respect to the stability of the bonds to H^+ions similar to that obtained for the R_2O_3 oxides. In sodium and lithium silicate glasses, ZrO_2 showed similar results. The electrode behavior of alkali silicate glasses into which oxides of Ti and Zr are incorporated can be explained by the formation of bonds in which the atoms of these elements are surrounded by oxygen in such a way that a complex is formed which carries a negative charge and which determines the predominantly ionic bond of hydrogen in the glass. Addition of barium oxide to lithium silicate glasses containing ZrO_2 seems to abolish the glass forming properties of ZrO_2. Orig. art. has: 7 figures.

ASSOCIATION: none

SUBMITTED: 21Jan64 ENCL: 00 SUB CODE: MT, IC

NO REF SOV: 011 OTHER: 001

Card 3/3

L 7578-66 EPA/EWT(m)/EWP(f)/FCC/EWP(j)/FCS(f)/EWP(n)/EWA(c)/ETC(m) RPL
WW/JWD/RM SOURCE CODE: UR/0405/65/000/001/0025/0030
ACC NR: AP5026023

AUTHOR: Belyayev, A. F. 44,55 (Moscow); Kondrashkov, Yu. A. 44,55 (Moscow); Lukashenya, G. V. (Moscow); Parfenov, A. K. 44,55 (Moscow); Tsygankov, S. A. 44,55 (Moscow)

ORG: none

TITLE: Flame combustion of model mixtures of oxidizer with fuel

SOURCE: Nauchno-tekhnicheskiye problemy goreniya i vzryva, no. 1, 1965, 25-30

TOPIC TAGS: propellant, solid propellant, combustion, composite propellant, burning velocity

ABSTRACT: The relationship between the burning velocity (u) and pressure (p) of composite propellants has been studied at subatomic pressure. Ammonium perchlorate-trotyl, potassium perchlorate-trotyl, ammonium perchlorace-asphalt, ammonium perchlorate-paraformaldehyde, and ammonium perchlorate-polystyrene were ground to 20 to 40 μ and intensively mixed and compacted to 98% of the maximum density. Although the propellants had different fuels, oxidizers, and polymer binders, the u-vs-p relationships were linear. Therefore, it appears that systems which contain sufficiently fine components and a fuel which can be

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gasified by decomposition, pyrolysis, or evaporation, give linear u-vs-p relationships at subatmospheric pressure. The experimental results together with an evaluation of burning velocities at higher pressures, obtained previously, indicate that the following four regions exist: 1) a low-pressure region characterized by a plane flame front up to about 2 atm (D = 1); 2) the region of transition from a plane to a multiflame front with a nonlinear u-vs-p relationship (D < 1) at 2.5—3 to 100—250 atm; 3) a high-pressure region characterized by a multiflame front but with a linear u-vs-p relationship from 100—200 to 1000—1500 atm; and 4 a region above 1500 atm (D< 0.3—0.4). Multiflame fronts consist of flames which propagate along the fuel-oxidizer boundaries into the propellant. Orig. art. has: 6 figures. [PV]

SUB CODE: FP/ SUBM DATE: 02Nov64/ ORIG REF: 009/ OTH REF: 002/ ATD PRESS: 4141

Card 2/2

27923 S/123/61/000/017/003/[illegible]
A004/A101

14000

AUTHORS: Zemskov, G. V., Parfenov, A. K.

TITLE: Treatment of high-speed steel milling cutters in superheated steam

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 17, 1961, 74, abstract 17B481 ("Nauchn. zap. Odessk. politekhn. in-t", 1960, v. 26, 45-47)

TEXT: The authors investigated the effect of the treatment duration (30-180 minutes) in superheated steam at 540-560°C and the cutting conditions on the life of milling cutters made from P9 (R9) grade steel. The service life of milling cutters treated in superheated steam exceeds that of cutters having been heat-treated in the ordinary way by 25-85% when the 45 grade steel is milled, and by 45-100% during the milling of 40X (40Kh) grade steel. The authors recommend a duration of the treatment of 60 minutes. The increase of the tool life after steam treatment is connected with the change in the formation conditions of built-up edge owing to the formation of a Fe_3O_4 film on the surface. There are 4 figures and 6 references.

N. Il'ina

[Abstracter's note: Complete translation]

Card 1/1

S/123/62/000/019/002/010
A006/A101

AUTHORS: Gushchin L. K., Dombrovskaya, Ye. V., Zemskov, G. V., Parfenov, A. K., Yarkina, V. T.

TITLE: Gas nitriding with ultrasonic effect

PERIODICAL: Referativnyy zhurnal, Mashinostroyenie, no. 19, 1962, 25, abstract 19B134 ("Nauchn. zap. Odessk. politekhn. in-t", 1961, 35, 25 - 31)

TEXT: The authors studied the effect of ultrasonic waves upon the depth of the layer, structure, hardness on the surface, and distribution of hardness across the layer in gas nitriding at 500 and 550°C, 60 mm water col. gas pressure at a 40% degree of gas dissociation, and holding for 2, 4, 6, 8, 10 and 15 hours. The investigations were made with improved 35 XIOA (35KhYuA) steel specimens with HCR=28 - 30. For comparison the process was conducted in two ways: with ultrasonic oscillations of 18 - 20 kilocycle frequency and without them. An analysis of experimental results, obtained by investigating the structure, layer depth, determination of hardness according to Vikkers, and microhardness on the surface and across the layer, has shown that ultrasonic waves

Card 1/2

S/123/62/000/019/002/010
A006/A101

Gas nitriding with ultrasonic effect

increase the hardness across the layer, penetration depth of nitrogen, and microhardness of the base zone of the nitrided layer. The time of nitriding process with ultrasound is reduced 1.5 times as compared with nitriding without ultrasonic effect. There are 5 figures.

T. Kislyakova

[Abstracter's note: Complete translation]

Card 2/2

S/123/62/000/018/009/012
A006/A101

AUTHORS: Zemskov, G. V., Dombrovskaya, Ye. V., Yarkina, V. T., Gushchin, L. K., Parfenov, A. K.

TITLE: The effect of ultrasonic waves upon the nitriding process

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 18, 1962, 17, abstract 18B107 ("Nauchn. zap. Odessk. politekhn. in-t", 1961, 35, 90 - 96)

TEXT: Investigations were made in liquid and gas medium. The nitriding bath was melted in a X 18 H 9 (Kh18N9) steel crucible and was composed of 31% barium chloride, 48% calcium chloride and 21% sodium chloride. Ammonia was passed through the liquid bath to which ultrasonic oscillations were applied. Microhardness was measured over the section of a layer obtained in liquid nitriding with and without ultrasonic oscillations. Gas nitriding was performed in a special-designed electric furnace (its schematic diagram is presented) under the following conditions: temperature - 540 - 560°C; holding time - 10 hours; gas pressure in the furnace 45 - 55 mm oil column. After completed holding the

Card 1/2

The effect of ultrasonic waves upon the...

ultrasonic oscillator was switched off. Cooling down to 400°C was performed during ammonia supply; and down to room temperature - together with the furnace. The schematic diagram of the furnace and curves of microhardness distribution over the cross section of the specimen after nitriding, are given. The results of gas and liquid nitriding were compared and showed the advantage of gas nitriding, yielding higher hardness and deeper penetration. The depth of the nitrided layer and hardness increase under the ultrasonic effect both for liquid and gaseous media.

T. Kislyakova

[Abstracter's note: Complete translation]

Card 2/2

L 21[illegible]-66 EWT(m)/EPF(c)/EWP(j)/T/EWA(c) RPL WW/JW/JWD/RM

ACCESSION NR: AP5026032 UR/0405/65/000/001/0109/0111

AUTHOR: Parfenov, A. K. (Moscow); Apin, A. Ya. (Moscow)

35
B

TITLE: Low-velocity detonation in powdered explosives

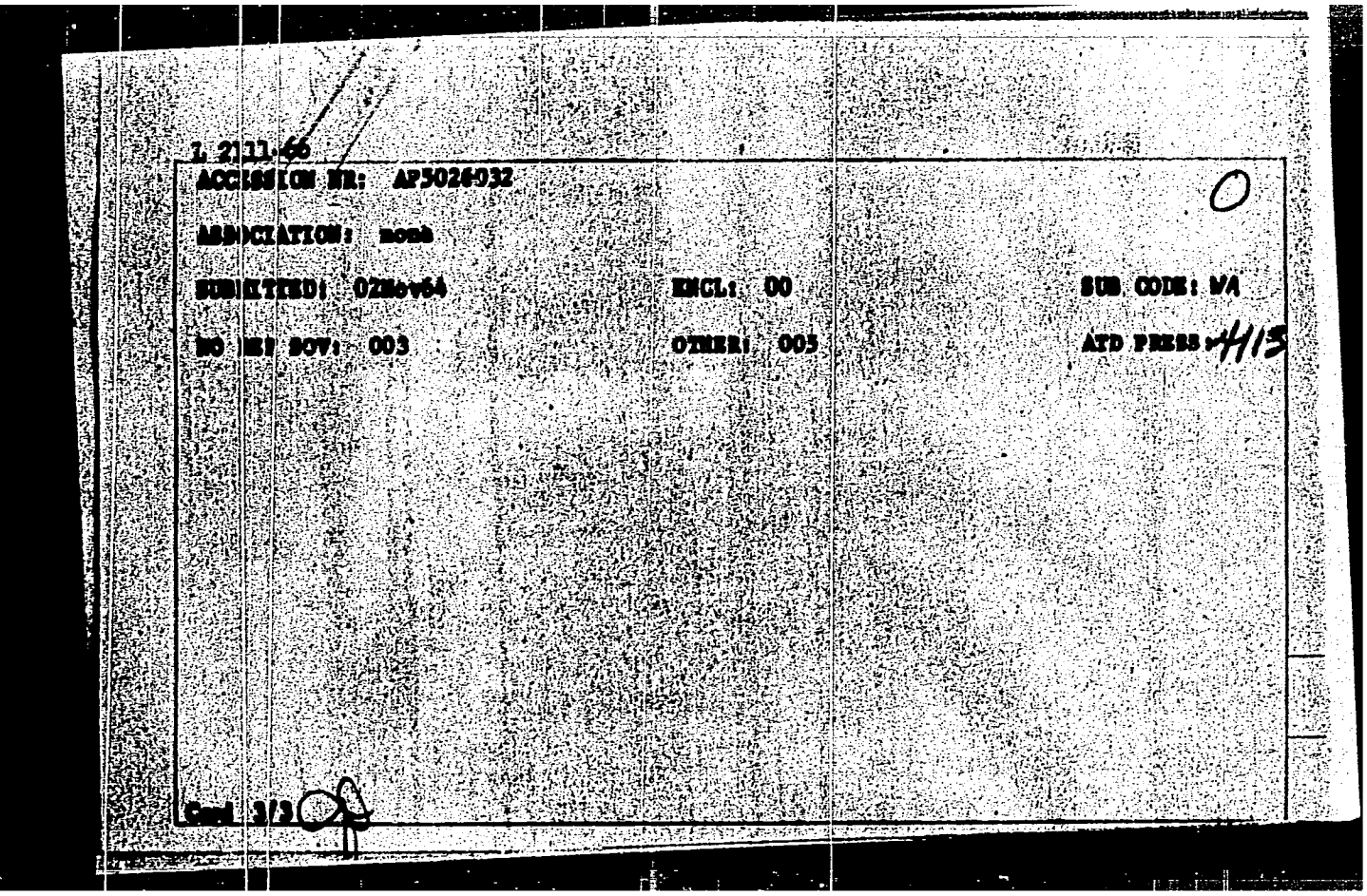
SOURCE: Nauchno-tekhnicheskiye problemy goreniya i vzryva, no. 1, 1965, 109-111

TOPIC TAGS: explosive, detonation theory, weak detonator, strong detonator, detonation velocity, detonation

ABSTRACT: Previous studies have shown that the detonation velocity D in liquid- and solid-explosive charges depends mainly on the power of the detonator. This dependence was studied using the high-speed photographic camera ZhFR-2. Charges (5—10 mm in diameter d and 50—480 mm long) of trotyl, tetryl, and hexogen were detonated with a weak and a strong detonator. A trotyl-NaCl (50/50) equib (d = 20 mm, density ρ = 1.0[illegible] g/cc, and D = 2000 m/sec) was used as the weak detonator; the same size equib of compacted trotyl (ρ = 1.62 g/cc, D = 6900 m/sec) was used as the strong detonator. The charge diameter dependence curves of the detonation velocity (D vs. d) show that in all cases where the charges are detonated with the weak detonator, there is a certain charge diameter range within which low-velocity detonation is stable. The low-velocity detonation increased from 1200 to 1800—2200 m/sec as the charge diameter increased. In the case of tetryl, the

Card 1/[illegible]

velocity also depends on the size of its particles. The upper limit of d ... which low-velocity detonation is stable varies with the explosive (~30 mm for trotyl, ~17 mm for hexogen, and ~20 mm for tetryl with a particle size of 1.0—1.6 mm). The low-velocity detonation regime which is developed in tetryl and hexogen charges changes suddenly to a normal velocity regime after a distance of about 2—4 d of the charge. In trotyl charges, the low-velocity detonation changes slowly to a normal regime. In the explosive charges detonated with the strong detonator, a stable normal velocity detonation regime is established at a short distance from the initiation point and in the case of trotyl and hexogen, the detonation propagates with an approximately constant velocity over the d range studied. In the case of tetryl, a stable detonation was observed only in charges of a certain diameter. Thus, in trotyl and hexogen charges, depending on the detonator used, stable low-velocity or normal-velocity detonation regimes are established in a certain range of diameters; and, in the case of tetryl, a stable detonation regime is established only in charges of a certain diameter regardless of the detonator used. To explain the low-velocity detonation initiated by a weak detonator, it is suggested that the amount of heat liberated during initiation by a weak detonator is not sufficient to maintain the combustion inside the charge particles and so the combustion propagates on their surface. Orig. art. has: 3 figures and 1 formula. [PS]



APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001239220003-9"

AFANASENKOV, A.N.; VOSKOBOYNIKOV, I.M.; SOSNOVA, G.S.; PARFENOV, A.K.

Study of the initiation of the combustion of a nitroglycerin charge and its mixtures by shock waves. Vzryv. delo no.52/9: 195-200 '63. (MIRA 17:12)

1. Institut khimicheskoy fiziki AN SSSR.

ACCESSION NR: AT4002169 S/2998/63/000/052/0103/0108

AUTHOR: Parfenov, A. K.; Apin, A. Ya.

TITLE: Influence of the explosive charge casing on the relative blast momentum

SOURCE: Nauchno-tekhnicheskoye gornoye obshchestvo. Vzry*vnoye delo. Sbornik, no. 52/9, 1963. Promy*shlenny*ye vzry*vchaty*ye veshchestva; detonatsiya, goreniye, deystviye vzry*va v gornoy srede, 103-108

TOPIC TAGS: blast momentum, brisance, heat release, detonation wave, shock wave pressure distribution, detonation products, relative momentum, reaction zone, cased charge, detonation, TNT, hexogen, TNT explosive, TNT hexogen mixture, TNT hexogen mixture explosive

ABSTRACT: A qualitative explanation is undertaken of the influence of the casing material on the relative impulse of an explosive charge and of the possibility of the existence of additional heat release behind the front of the detonation wave of an encased charge. The testing apparatus of Kast's type has been described in detail by Apin, Bardin and Vyelina. The

Card 1/4

ACCESSION NR: AT4002169

following equation is used to calculate the relative impulse from the measured impulse J:

$$J_{rel.} = \frac{J}{J_{st.}} \quad 100\% = \sqrt{\frac{B}{B_{st}}} \quad 100\%$$

where the subscript "st" refers to a standard 50/50 hexogen-TNT mixture (ρ_0 = 1.68 g/cc, D - 7.65 km/sec) whose impulse is taken as 100% and B is the brisance according to Haid and Zelle (Z. fur das gesamte Schiess-und Sprengstoffwesen, v. 29, No. 11, 1934). Experimental data is shown in Figure 1 of the Enclosure. It is concluded that the casing acts as a compressible fluid in the sense that the smaller the velocity of the shockwave in the casing, the later casing starts to accelerate, bringing the values of pressure and temperature of the detonation products closer to those obtained in the zone of chemical reaction. Thus, the relative impulse of TNT for any given casing thickness becomes larger for those materials in which the shock wave velocity is small. The effect of casing also causes an additional heat release behind the front of the detonation wave of TNT because the drop in temperature and pressure is slowed down and the pressure-sensitive heterogeneous chemical reactions such as $2CO \rightleftharpoons CO_2 + C$ are more thorough and release more heat. Orig. art. has: 8

Card 3/4

ACCESSION NR: AT4002169

formulas, 4 figures and 1 table.

ASSOCIATION: IKhF AN SSSR

SUBMITTED: 00	DATE ACQ: 10Dec63	ENCL: 01
SUB CODE: WA	NO REF SOV: 005	OTHER: 005

Card 3/4

ACCESSION NR: AT4002169

ENCLOSURE: 01

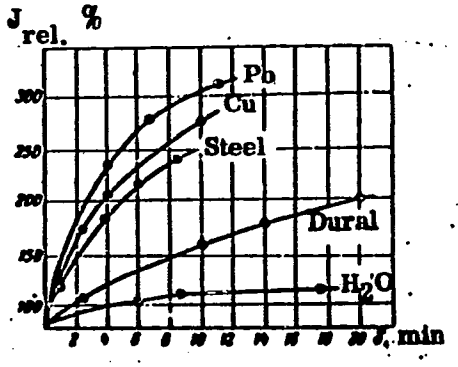


Fig. 1. Dependence of the relative impulse J_{rel} of TNT with a density of 1.63 g/c on the casing thickness δ for various casing materials.

Card 4/4

ACCESSION NR: AT4002175 S/2996/63/000/052/0195/0201

AUTHOR: Afanasenkov, A. N.; Voskoboynikov, I. M.; Sosnova, G. S.; Parfenov, A. K.

TITLE: Combustion initiation shock wave of nitroglycerine charges and its mixtures

SOURCE: Nauchno-tekhnicheskoye gornoye obshchestvo. Vzry*vnoye delo. Sbornik, no. 52/9, 1963. Promy*shlenny*ye vzry*vchaty*ye veshchestva; detonatsiya, goreniye, deystviye vzry*va v gornoy srede, 195-201

TOPIC TAGS: detonation, shock wave, high-speed combustion, detonation failure, high explosive, combustion initiation, shock wave combustion initiation, nitroglycerine, nitroglycerine charge, ammonite PZhV-20, ammonite PZhV-20 explosive nitroglycerine TNT mixture, nitroglycerine TNT mixture charge

ABSTRACT: Processes other than stable detonation have been observed in explosive charges, e.g. low-speed detonation, combustion inside of massive shells or holes, combustion in thin layers during drop-hammer tests of shock sensitivity, etc. These processes were investigated to help prevent detonation failures. Detonation and combustion procedures were investigated with nitroglycerine charges and with charges of sodatol (trotyl mixed with sodium chloride) across a 2-3 mm thick plexiglas wall. It was found that a detonation rate of 7650 m/sec occurred in passive nitroglycerine charges and that

Card 1/2

ACCESSION NR: AT4002175

the sodatol-active charge detonated at rates greater than 2500 m/sec. It was concluded that combustion velocities obtained with nitroglycerine and its mixtures with ammonium nitrate are equal, and therefore, that decomposition of nitroglycerine plays a decisive role in the combustion process. Detonation failure of safety explosive charges in holes was also studied. It was concluded that detonation failures in safety explosives are more probably between cartridges than in one continuous charge and that at charge densities of 1.5 g/cc and over, detonation transmission from cartridge to cartridge is improbable. Further, the burning out of charges of safety explosives can be attributed to the initiation of combustion by shock waves by the transmission of detonation from cartridge to cartridge. The authors suggested that any sensitizer for safety explosives should be investigated for a tendency to burn out under the effect of shock waves. Orig. art. has: 6 figures

ASSOCIATION: IKHF AN SSSR

SUBMITTED: 00 DATE ACQ: 10Dec63 ENCL: 00

SUB CODE: WA NO REF SOV: 002 OTHER: 001

Card 2/2

PARFENOV, A.K.; APIN, A.Ya.

Effect of charge shells on the relative detonation impulse.
Vzryv. delo no.52/9:103-108 '63. (MIRA 17:12)

1. Institut khimicheskoy fiziki AN SSSR.

ACCESSION NR: AP4010077 S/0129/64/000/001/0052/0055

AUTHOR: Kemskov, G. V.; Dombrovskaya, Ye. V.; Yarkina, V. T.; Gushchin, L. K.; Parfenov, A. K.

TITLE: Intensified nitration by the use of ultrasonics

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 1, 1964, 52-55

TOPIC TAGS: gas nitration, steel nitration, microhardness, ultrasonic reflection, ultrasonic oscillation, picric acid, nitric acid, magnetostrictor, ammonia

ABSTRACT: An investigation to determine the effect of ultrasonic oscillations on gas nitration of steel revealed that ultrasonic waves increase the depth of the resultant nitride and improve the quality of microhardness. The reflection of the ultrasonic from solid and gas media, however, made its use in combination with gas nitration uneconomical. A further study has therefore been made on the effect of ultrasonics on the nitration process in a liquid medium using a device

Card 1/2

ACCESSION NR: AP4010077

shown in the enclosure. The results of the experiments and the information available in literature justify the belief that the liquid nitration process is more effective where a gas phase is absent, and the substance containing the diffused element is in direct contact with the sample. Under such conditions the dissociation reaction will occur on the metal surface. Ultrasonics is found to accelerate the liquid nitration process in a neutral bath through which ammonia is passed. The nitrogen diffusion in a liquid medium is facilitated apparently by the great pressure produced as the cavitation bubbles are shut-in near the surface of the processed metal. Orig. art. has: 4 figures.

ASSOCIATION: Odesskiy polytekhnicheskiy institut (Odessa Polytechnical Institute)

SUBMITTED: 00 DATE ACQ: 07Feb64 ENCL: 01

SUB CODE: ML, CH NO REF SOV: 002 OTHER: 000

Card 2/2

BELYAYEV, A.F.; KOROTKOV, A.I.; PARFENOV, A.K.; SULIMOV, A.A.

Burning velocity of some explosives and mixtures at considerably increased pressures. Zhur.fiz.khim. 37 no.1:150-156 Ja '63. (MIRA 17:3)

1. Institut khimicheskoy fiziki AN SSSR.

ZEMSKOV, G.V.; DOMBROVSKAYA, Ye.V.; YARKINA, V.T.; GUSHCHIN, L.K.; PARFENOV, A.K.

Intensified nitriding by ultrasonic waves. Metalloved. i term. obr. met. no.1:52-55 Ja '64. (MIRA 17:3)

1. Odesskiy politekhnicheskiy institut.

S/810/62/000/000/006/013

AUTHORS: Zemskov, G.V., Gushchin, L.K., Dombrovskaya, Ye.V., Parfenov, A.K., Yarkina, V.T.

TITLE: The nitriding of steel under ultrasonic action

SOURCE: Metallovedeniye i termicheskaya obrabotka; materialy konferentsii po metallovedeniyu i termicheskoy obrabotke, sost. v g. Odesse v 1960 g. Moscow, Metallurgizdat, 1962, 211-214.

TEXT: The paper reports the results of an experimental investigation intended to clarify the generally contradictory statements of various antecedent authors, both Soviet and Western, on the existence of presumably accelerating effect of ultrasonic (US) vibrations (V) on solid liquid carburization and nitriding. Specimens of steel 35XIOA (35KhYuA), 60 mm long, were threaded at one end for attachment to the test equipment. The steel had been previously refined, and a sorbitic structure with R_C 28-30 had been obtained. Ammonia (AM) was fed into the furnace, beginning at 200°. At nitriding temperature (T), the AM was about 40% dissociated, at a pressure of 60 mm oil column. After holding, the specimen was cooled to 200° in the furnace in an AM medium. Nitriding T was 500 and 550°, holding time 2, 4, 6, 8, 10, and 15 hrs with and without US exposure. Liquid

Card 1/3

The nitriding of steel under ultrasonic action. S/810/62/000/000/006/013

nitriding was done in a bath containing 31% $BaCl_2$, 48% $CaCl_2$, and 21% NaCl, through which AM was passed and into which US vibrations were entered by means of a concentrator. Liquid-nitriding T was 550-560°, holding time 9 hrs at an ammonia pressure of 330-360 mm oil column. Intensive "boiling" of the bath was observed. An electron-tube generator with an output power of 2.5 kw and a frequency range from 18-35 kcps was employed as a source of US V. Graphed microhardness cross-sections across the layer affected show the favorable effect of US V in increasing hardness, increasing the depth of the penetration of N, and also in the attainment of a more uniform microhardness throughout the nitrided layer, especially for holding times in excess of 6 hrs. Application of US V permits a 40% reduction in process duration. The favorable effect of US V is attributed to the periodic change of the lattice parameters and the increase in the mean-square amplitude in the thermal oscillations of the ions in the lattice points of the crystalline lattice as a result of the local increase in temperature. In interstitial solid solutions the imposition of US V renders the phase coincidence between the N ions and the nearest Fe ions more likely and more frequent, and hence expedites the nitriding process. The US V also eliminate the reaction products from the metal surface and assure a continuous supply of fresh portions of gas, which also increases the time rate of the chemical processes and the dissolution process, and, hence, increases the N concentration in the surface layer. The US formation of ultra-

Card 2/3

The nitriding of steel under ultrasonic action. S/810/62/000/000/006/013

microscopic pores in the metal also facilitates the adsorption accompanying the diffusion of surface-active elements. There are 4 figures and 7 references (1 Russian-language Soviet, 3 French, 2 German, and 1 English-language: Heedeman, E., J. Acoust. Soc. Am., v.26, no.5, 1954, 831-842).

ASSOCIATION: Odesskiy politekhnicheskiy institut (Odessa Polytechnical Institute).

Card 3/3

20261

S/129/61/000/003/007/011
E073/E335

18 7530 1145 also 1454, 1573

AUTHORS: Zemskov, G.V., Gushchin, L.K., Dombrovskaya, Ye.V., Parfenov, A.K. and Yarkina, V.T.

TITLE: Nitriding of Steel Under the Effect of Ultrasonics

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1961, No. 3, pp. 40 - 42

TEXT: The authors studied the nitriding of steel under the effect of ultrasonics in gaseous and liquid media. For the gas nitriding, steel 38XMOA (35KhYuA) was used in the heat-treated state (H_{RC} 28-30). Prior to nitriding the specimens were carefully degreased with alcohol. The ammonia was always fed into the furnace at 200 °C to prevent excitation. The degree of dissociation of the ammonia during nitriding (at 500 - 550 °C) equalled 40%. At the termination of the process the specimens were cooled to 200 °C in ammonia. The process was carried out with and without ultrasonics. Liquid nitriding was in a salt bath (calcium chloride 48% barium chloride 31% sodium chloride 21%) and ammonia was placed into it. The process was

Card 1/3

Nitriding of Steel ....

carried out at 550 - 560 °C with a holding time of 9 hours and an ammonia pressure of 330 - 360 mm oil column. The ultrasonics were produced by a 2.5 kW 18-35 kc/s tube oscillator and they were transmitted to the bath by a "Permendur" magnetostriction vibrator. The results were evaluated by measuring the hardness and the microhardness of the surface. Fig. 1 shows the influence of ultrasonics on the change of microhardness along the cross section of a layer nitrided at 550 °C H_μ versus distance from the surface (Curves 1 - without ultrasonics; Curve 2 - with ultrasonics). The plots, Fig. 1, from left to right, related to the nitriding times of 2, 4, 6, 8, 10 and 15 hours, respectively. The ultrasonics brought about an increase in hardness and depth of penetration of the nitrogen, ensuring a stable increase in the microhardness in the basic zone of the nitrided layer. For process durations of 6 hours and more, the microhardness of specimens treated with ultrasonics was appreciably higher than that of those not treated. The use of ultrasonics enables reducing the duration of the process by a factor of 1.5. The change in the

Nitriding of Steel ....

microhardness brought about by liquid nitriding using ultrasonics (Curve 1) and without using ultrasonics (Curve 2) is plotted in Fig. 3 (hardness, H_μ versus distance from the surface). As a result of ultrasonics treatment the depth and hardness of the diffusion layer are increased.
There are 3 figures.

ASSOCIATION: Odesskiy politekhnicheskiy institut
(Odessa Polytechnical Institute)

Card 3/5

ZEMSKOV, G.V.; GUSHCHIN, L.K.; DOMBROVSKAYA, Ye. V.; PARFENOV, A.K.; YARKINA, V.T.

Ultrasonic nitriding of steel. Metalloved. i term. obr. met. no.3:40-42 Mr '61. (MIRA 14:6)

1. Odesskiy politekhnicheskiy institut.
(Cementation (Metallurgy))
(Ultrasonic waves--Industrial applications)

PARFENOV, A. M.

PA 15/49T99

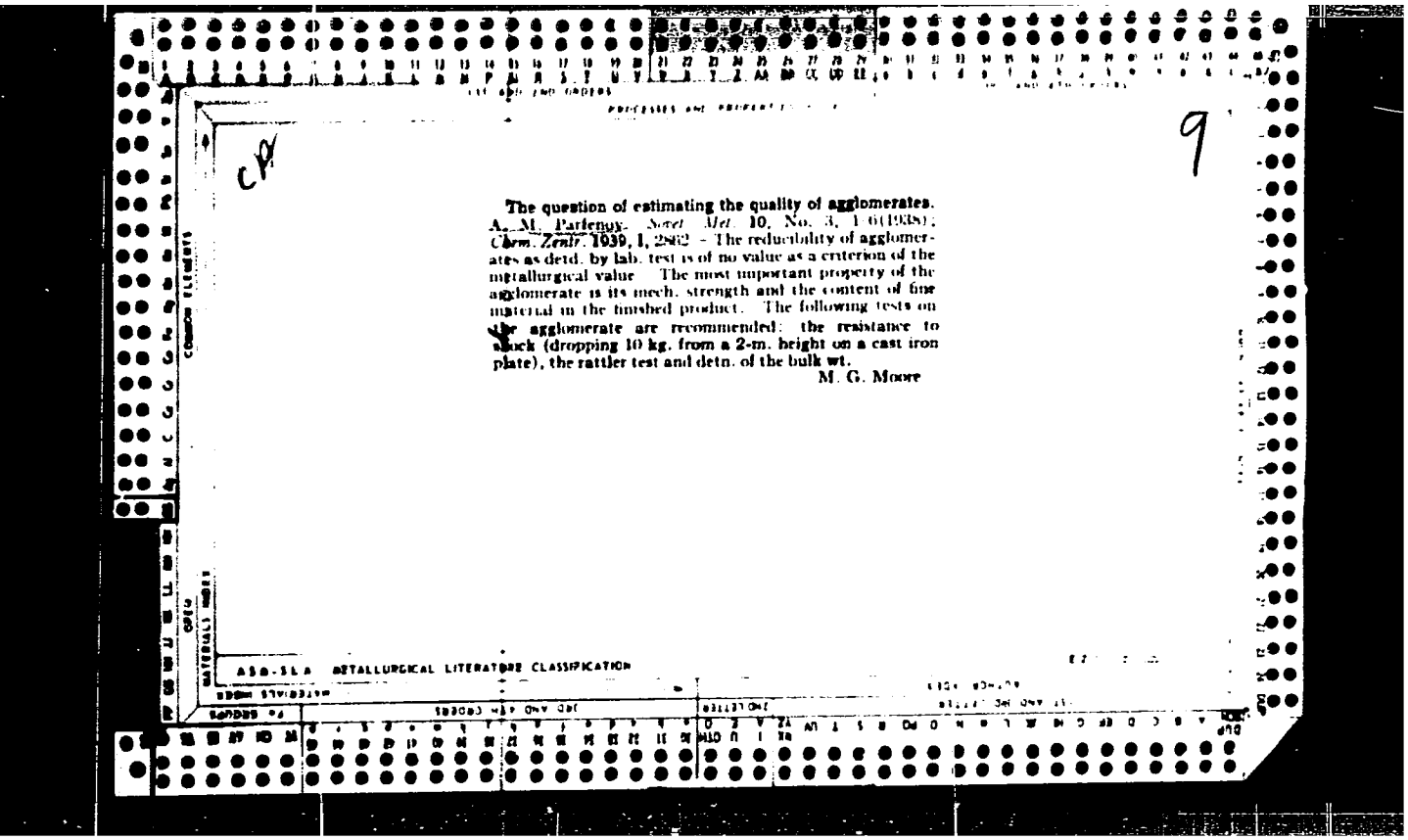
USSR/Metals Sep 48
Iron Ore - Concentration

"Magnetizing Heating of Iron Ores," A. M. Parfenov, Mekhanobr, 3 pp

"Gor Zhur" No 9

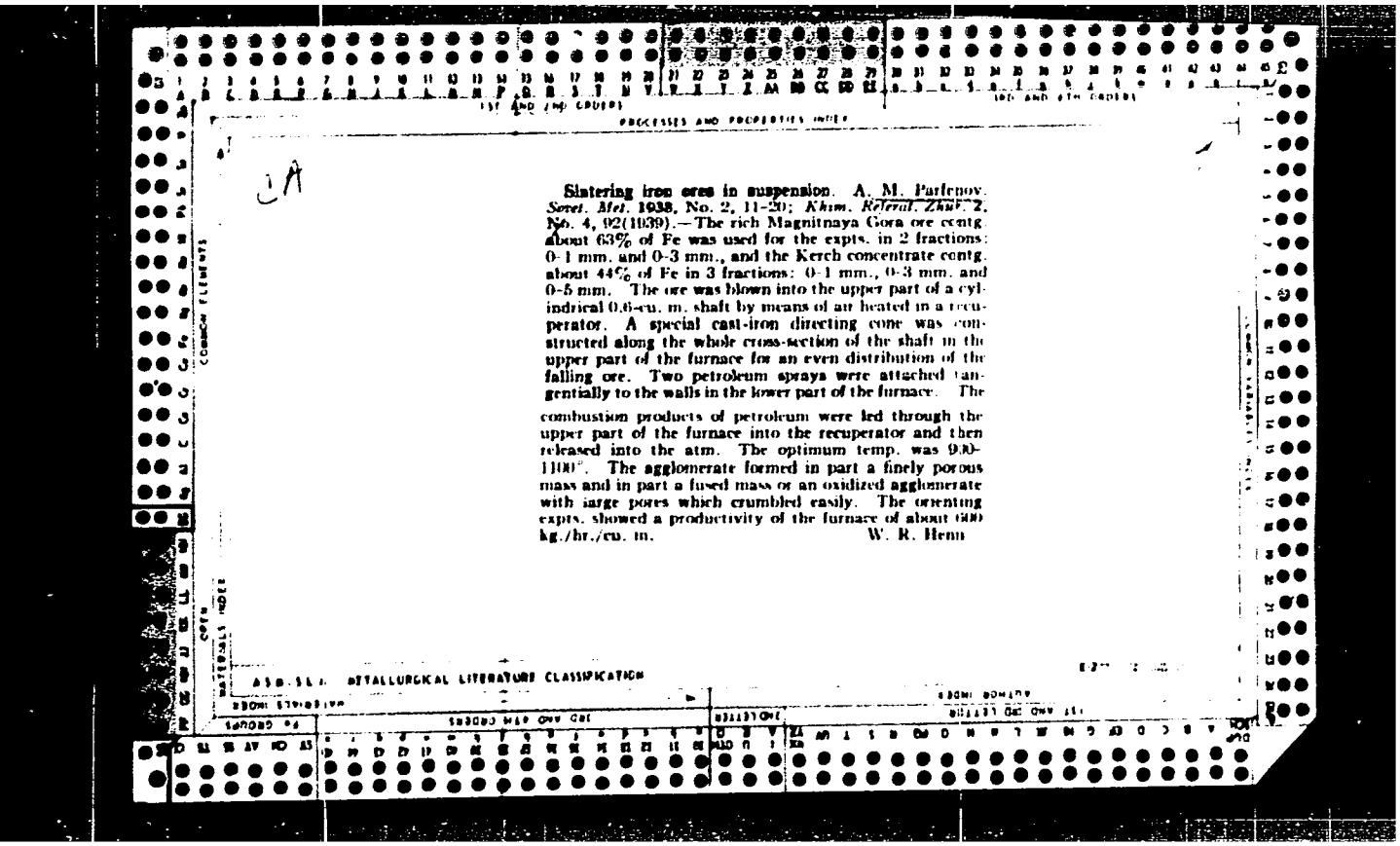
Describes method of dressing iron ores, based on alteration of magnetic properties by heating oxides with reducing agent. Further research is needed.

FDB 15/49T99



The question of estimating the quality of agglomerates. A. M. Parfenov. *Steel Met.* **10**, No. 3, 1-6(1938); *Chem. Zentr.* **1939**, I, 2862 – The reducibility of agglomerates as detd. by lab. test is of no value as a criterion of the metallurgical value. The most important property of the agglomerate is its mech. strength and the content of fine material in the finished product. The following tests on the agglomerate are recommended: the resistance to shock (dropping 10 kg. from a 2-m. height on a cast iron plate), the rattler test and detn. of the bulk wt.

M. G. Moore



Sintering iron ores in suspension. A. M. Parfenov. *Sovet. Met.* **1938**, No. 2, 11–20; *Khim. Referat. Zhur.* 2, No. 4, 92(1939).—The rich Magnitnaya Gora ore contg. about 63% of Fe was used for the expts. in 2 fractions: 0–1 mm. and 0–3 mm., and the Kerch concentrate contg. about 44% of Fe in 3 fractions: 0–1 mm., 0–3 mm. and 0–5 mm. The ore was blown into the upper part of a cylindrical 0.6-cu. m. shaft by means of air heated in a recuperator. A special cast-iron directing cone was constructed along the whole cross-section of the shaft in the upper part of the furnace for an even distribution of the falling ore. Two petroleum sprays were attached tangentially to the walls in the lower part of the furnace. The combustion products of petroleum were led through the upper part of the furnace into the recuperator and then released into the atm. The optimum temp. was 900–1100°. The agglomerate formed in part a finely porous mass and in part a fused mass or an oxidized agglomerate with large pores which crumbled easily. The orienting expts. showed a productivity of the furnace of about 600 kg./hr./cu. m. W. R. Henn

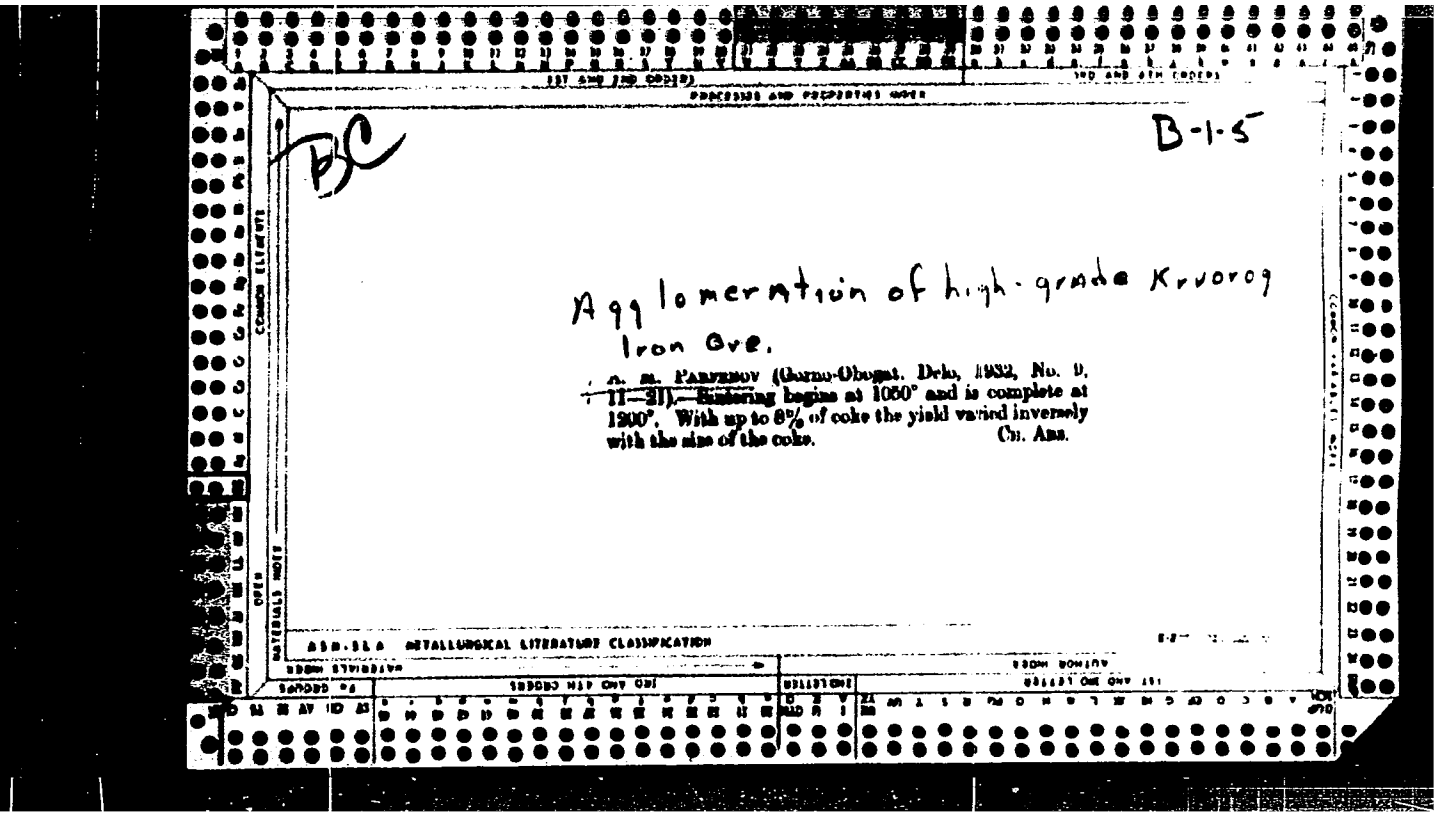
PROCESSES AND PROPERTIES INDEX

BC

B·I·5

Agglomeration of Bakal iron ores. A. M. Parfenov (Gorno-Obogat. Delo, 1953, No. 1, 13--17).--The ore (Fe 46·46--59·40%) was roasted to a form suitable for the blast furnace. CH. ABS.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



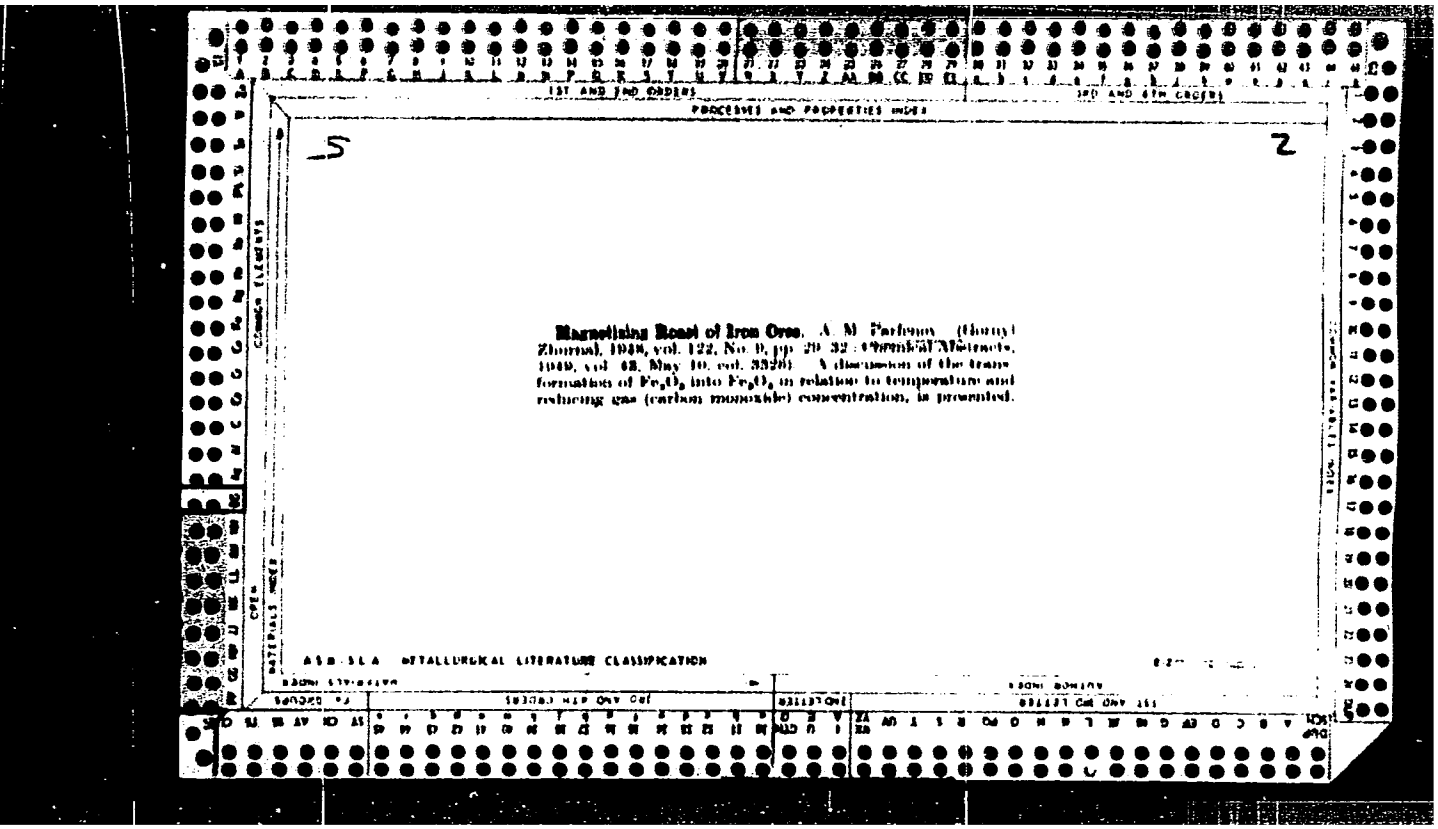
BC

B-1-5

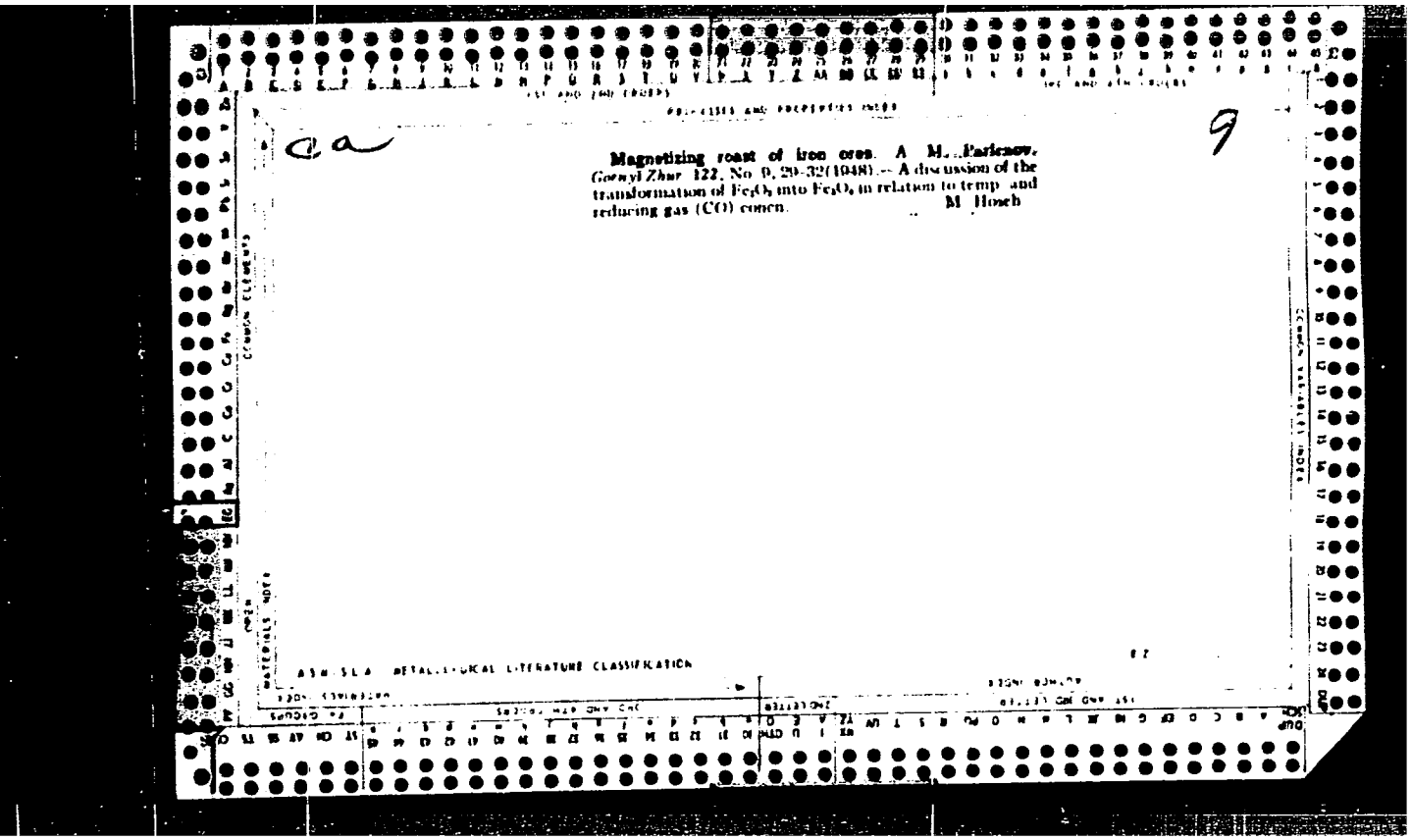
Agglomeration of high-grade Krivoy Iron Ore.

A. M. PARFENOV (Ukrno-Obogat. Delo, 1932, No. 9, 11—31).—Sintering begins at 1050° and is complete at 1200°. With up to 8% of coke the yield varied inversely with the size of the coke. Ch. Abs.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Magnetizing Roast of Iron Ores. A. M. Parkson. (Berg. i Zhurnal, 1938, vol. 122, No. 9, pp. 29-32.) [illegible] 1949, vol. 68, May 10, col. 3326.) A discussion of the transformations of Fe_2O_3 into Fe_3O_4 in relation to temperature and reducing gas (carbon monoxide) concentration, is presented.

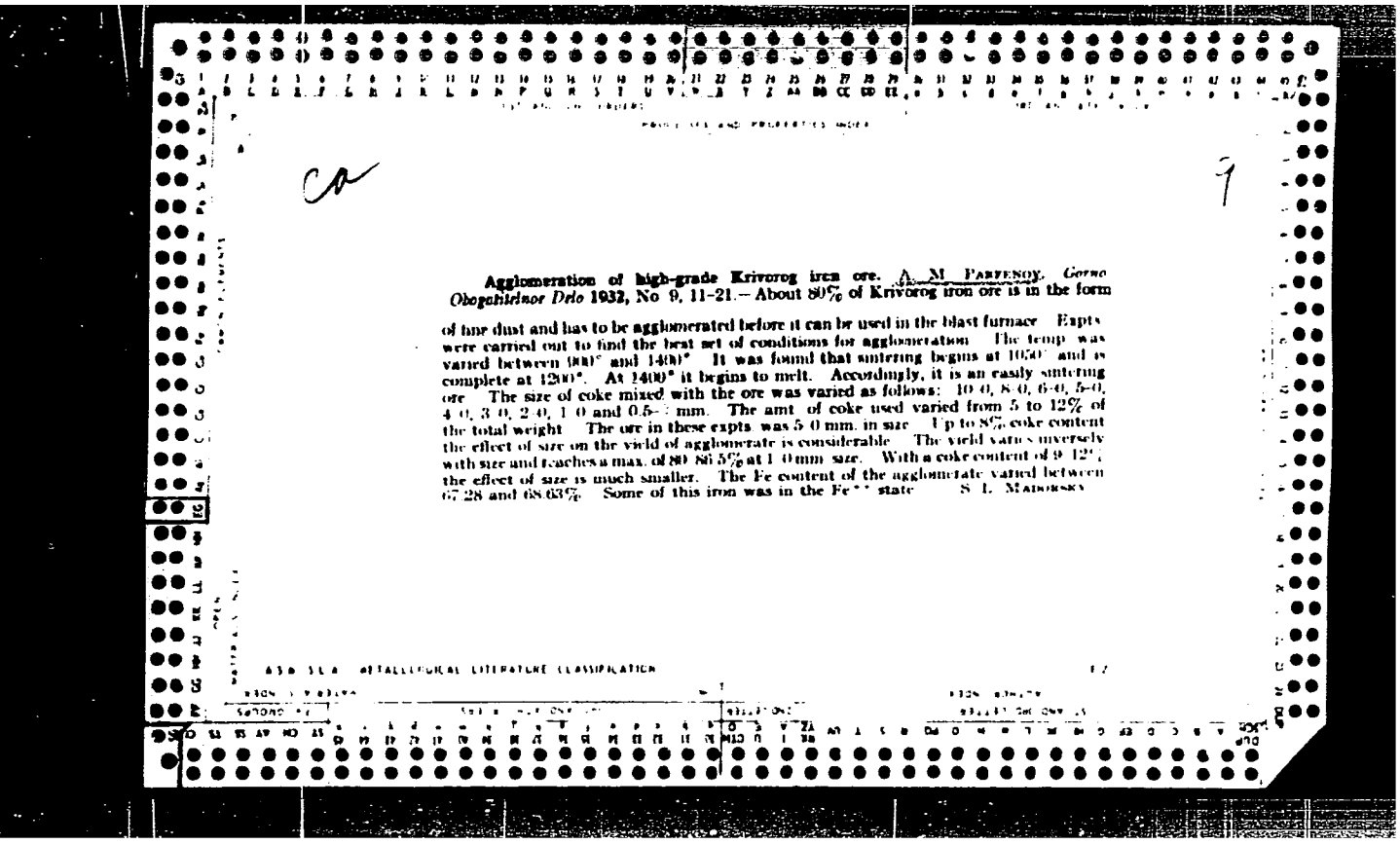


Magnetizing roast of iron ores. A M. Pariseev. *Gornyi Zhur* 122, No 9, 29-32(1948).—A discussion of the transformation of Fe_2O_3 into Fe_3O_4 in relation to temp and reducing gas (CO) concn. M Hosch

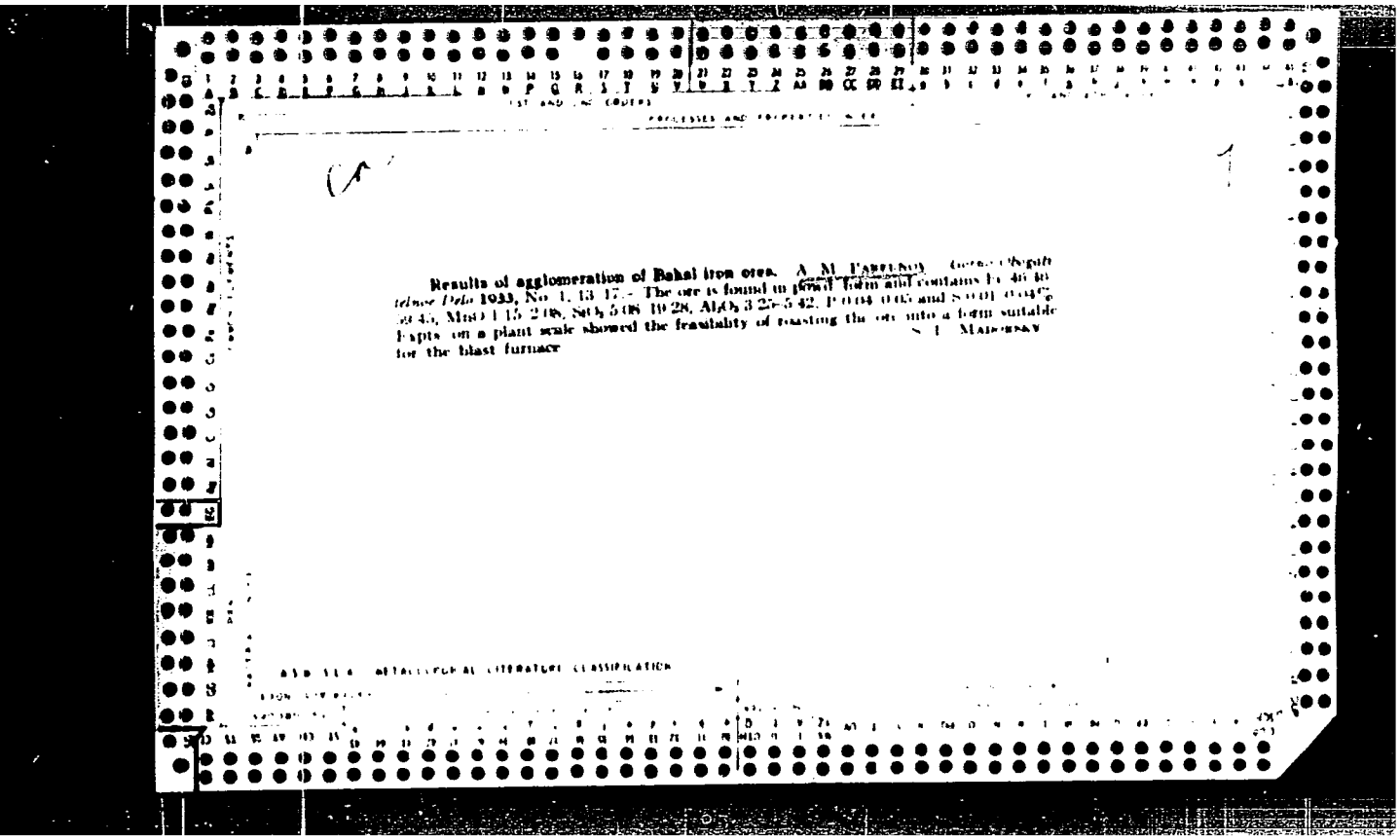
PARFENOV, A. M.

20727 Parfenov, A. M. Bosstanovitel'nyy ili vosstanovitel'noshlite'nyy obzhig burykh zheleznyakov. Gornyy zhurnal, 1949, No. 7, s. 35-38

SO: LETOPIS ZHURNAL STATEY - Vol. 28, Moskva, 1949



Agglomeration of high-grade Krivorog iron ore. A. M. Parfenov. *Gorno Obogatitelnoe Delo* **1932**, No 9, 11–21.—About 80% of Krivorog iron ore is in the form of fine dust and has to be agglomerated before it can be used in the blast furnace. Expts were carried out to find the best set of conditions for agglomeration. The temp was varied between 900° and 1400°. It was found that sintering begins at 1050° and is complete at 1200°. At 1400° it begins to melt. Accordingly, it is an easily sintering ore. The size of coke mixed with the ore was varied as follows: 10–0, 8–0, 6–0, 5–0, 4–0, 3–0, 2–0, 1–0 and 0.5–1 mm. The amt of coke used varied from 5 to 12% of the total weight. The ore in these expts was 5–0 mm. in size. Up to 8% coke content the effect of size on the yield of agglomerate is considerable. The yield varies inversely with size and reaches a max. of 80–86.5% at 1–0 mm. size. With a coke content of 9–12% the effect of size is much smaller. The Fe content of the agglomerate varied between 67.28 and 68.63%. Some of this iron was in the Fe^{++} state. S. L. Mamonsky

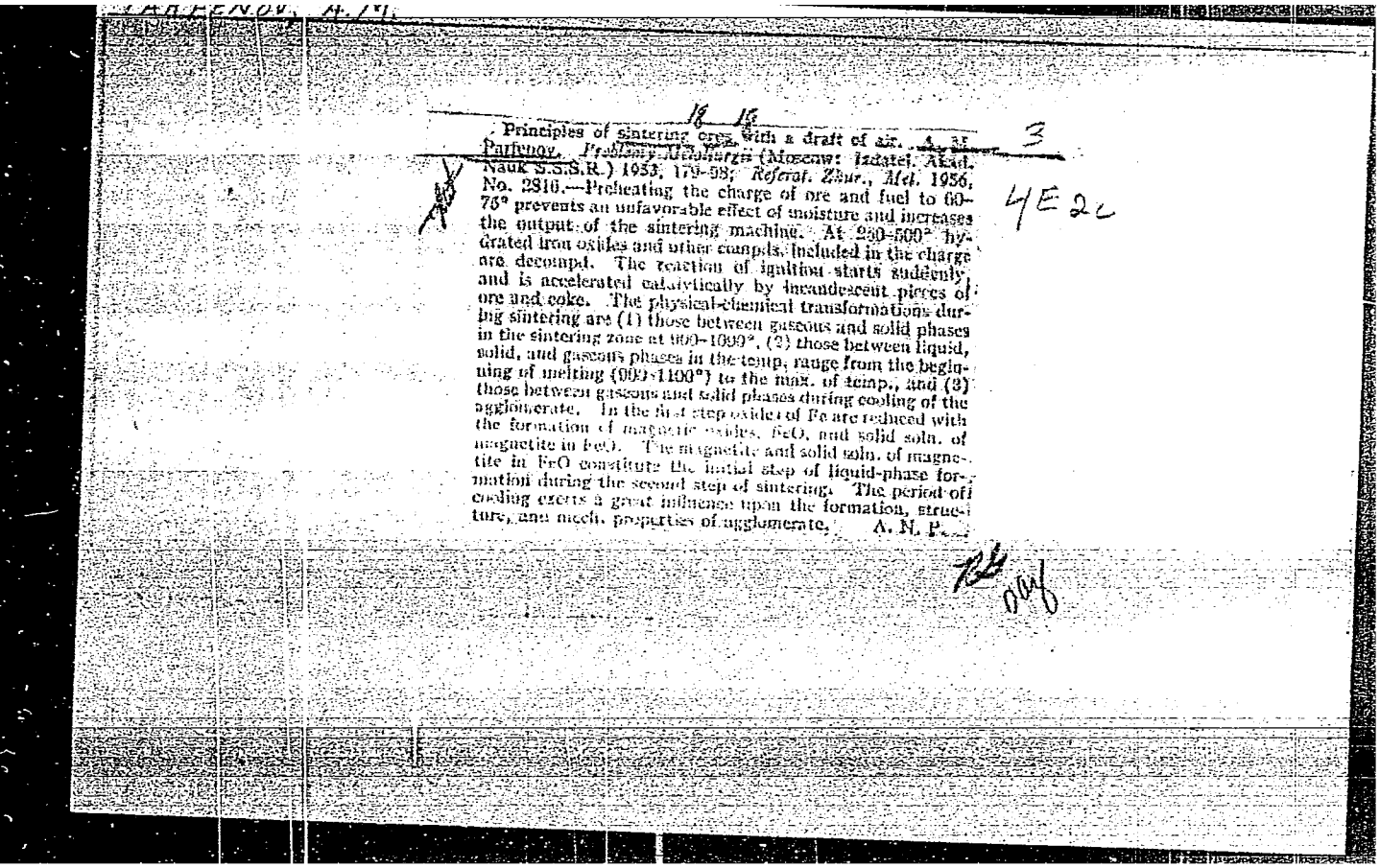


Results of agglomeration of Bakal iron ores. A. M. Pavlenov. *Ogneupory i Tekhnicheskaya Keramika* 1933, No. 1, 13–17.—The ore is found in pisolitic form and contains Fe 46.40, SiO$_2$ 4.45, MnO 1.15, P$_2$O$_5$ 0.08, TiO$_2$ 0.28, Al$_2$O$_3$ 3.25–5.42, P 0.04, CaO and S 0.01 (trace). Experiments on a plant scale showed the feasibility of roasting the ore into a form suitable for the blast furnace. S. I. Matveyev

C A

Reducing and reducing-oxidizing roasting of brown iron ores. A. M. Parfenov. *Gornyi Zhur* 123, No 7, 35-8 (1949). Samples of 10 different brown iron ores were roasted under reducing and reducing-oxidizing conditions to establish which of the 2 procedures is preferable for subsequent magnetic concn. The reducing medium was generator gas contg. 20-22% of CO or mazut dissocn. products. The roasting temp. was 600°. For the reducing-oxidizing roast the ore was heated to 600° for 20 min., then generator gas was passed for 45 min., the ore was then cooled in the oven to 350° in an atm. of gas, next the gas was stopped, the furnace opened, and the ore cooled in air. The duration of roasting and the preferred grain size were also studied. The results of subsequent magnetic sepn. showed no difference between the 2 methods. Better results were obtained when the roasting temp. was 650° or higher. The particle size of the roasted ore preferably should not exceed 25 mm. In all tests the highest extn. of Fe was obtained when the max. size was 0 mm.

M. Hoseh



Principles of sintering ores with a draft of air. A. N. Parfenov. *Problemy Metallurgii* (Moscow: Izdatel. Akad. Nauk S.S.S.R.) 1953, 179-98; *Referat. Zhur., Met.* 1956, No. 2816.—Preheating the charge of ore and fuel to 60-75° prevents an unfavorable effect of moisture and increases the output of the sintering machine. At 250-500° hydrated iron oxides and other compds. included in the charge are decompd. The reaction of ignition starts suddenly and is accelerated catalytically by incandescent pieces of ore and coke. The physical-chemical transformations during sintering are (1) those between gaseous and solid phases in the sintering zone at 800-1000°, (2) those between liquid, solid, and gaseous phases in the temp. range from the beginning of melting (900-1100°) to the max. of temp., and (3) those between gaseous and solid phases during cooling of the agglomerate. In the first step oxides of Fe are reduced with the formation of magnetic oxides, FeO, and solid soln. of magnetite in FeO. The magnetite and solid soln. of magnetite in FeO constitute the initial step of liquid-phase formation during the second step of sintering. The period of cooling exerts a great influence upon the formation, structure, and mech. properties of agglomerate. A. N. P.

SOV/137-58-10-20361

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10 p 2 (USSR)

AUTHOR: Parfenov, A. M.

TITLE: International Symposium on the Sintering of Iron Ores (Mezhdunarodnyy simpozium po aglomeratsii zheleznykh rud)

PERIODICAL: Obogashcheniye rud, 1957, Nr 6, pp 76-79

ABSTRACT: Delegates from 8 countries were present at the symposium and they delivered 29 papers. The Soviet delegation familiarized itself with the structure and work of the Institute of Ferrous Metallurgy and its branches in Lorraine. A brief description of the French Institute of Ferrous Metallurgy (IRSID) is presented

1. Iron ores--Sintering 2. Scientific reports

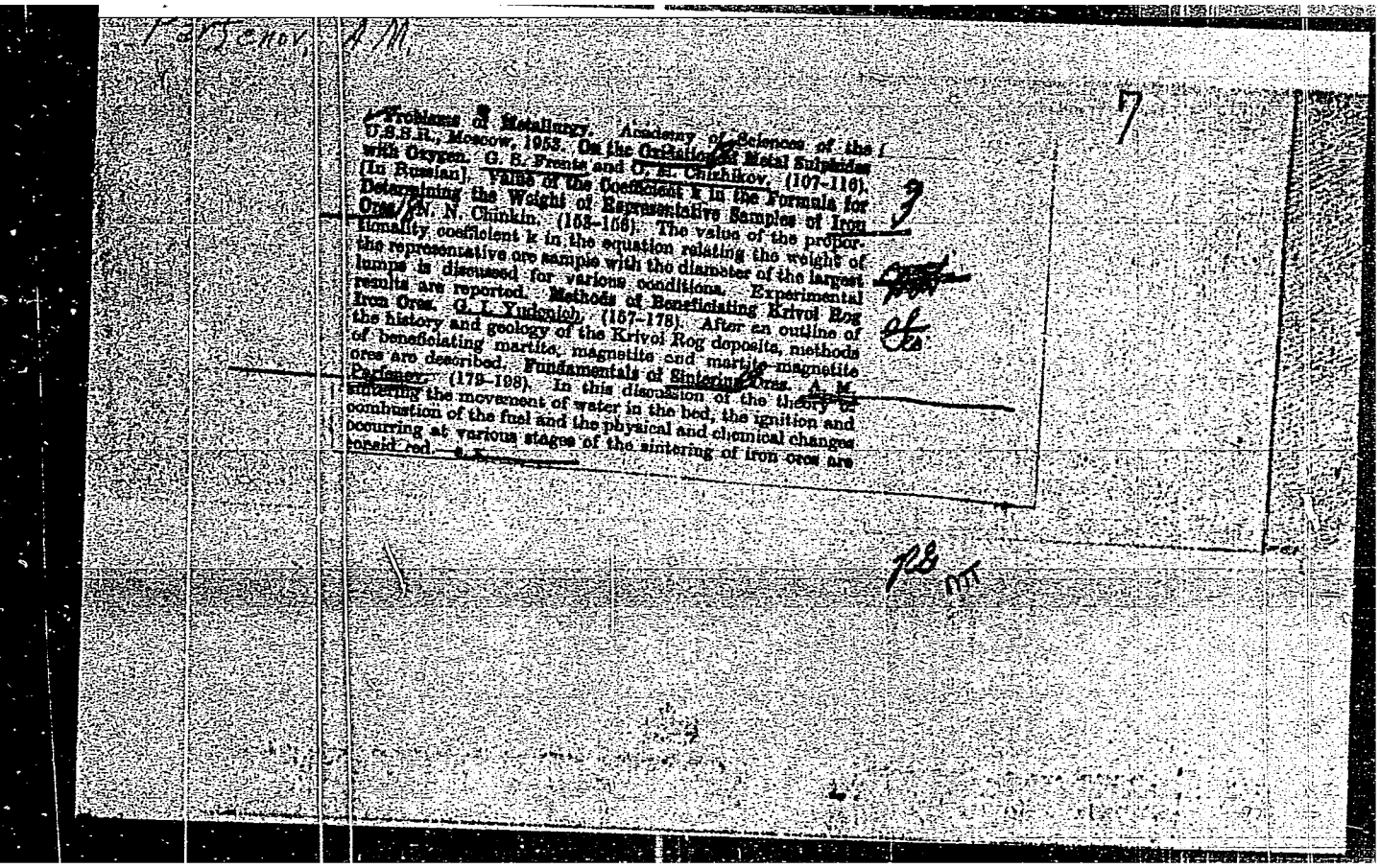
M. M.

Card 1/1

BOGDANOV, O.S., doktor tekhnicheskikh nauk, professor, redaktor; BRAND, V.Yu., kandidat tekhnicheskikh nauk, redaktor; DERKACH, V.G., kandidat tekhnicheskikh nauk, redaktor; DOLIVO-DOBROVOL'SKIY, V.V., doktor tekhnicheskikh nauk, redaktor; ZAKHVATKIN, V.K., redaktor; KACHAN, I.N., kandidat tekhnicheskikh nauk, redaktor; OLEVSKIY, V.A., kandidat tekhnicheskikh nauk, redaktor; LOKONOV, M.F., kandidat tekhnicheskikh nauk, redaktor; PARFENOV, A.M., kandidat tekhnicheskikh nauk, redaktor; PODNEK, A.K., redaktor; POLIVANOV, K.Yu., redaktor; FINKEL'SHTEYN, G.I., kandidat tekhnicheskikh nauk, redaktor; FOMIN, Ya.I., kandidat tekhnicheskikh nauk, redaktor; SHINYAKOV, M.I., redaktor; YUDENICH, G.I., doktor tekhnicheskikh nauk, redaktor; BYKOV, G.P., redaktor; YEZDOKOVA, M.L., redaktor izdatel'stva; EVENSON, I.M., tekhnicheskiy redaktor

[Proceedings of the Third Scientific Session of the Institute of Mechanical Processing of Economic Minerals] Trudy III nauchno-tekhnicheskoi sessii instituta Mekhanobr. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1955. 758 p. (MLRA 10:8)

1. Leningrad. Nauchno-issledovatel'skiy i proyektnyy institut mekhanicheskoy obrabotki poleznykh iskopayemykh
(Ore dressing) (Flotation)



Problems of Metallurgy. Academy of Sciences of the U.S.S.R., Moscow, 1953. On the Oxidation of Metal Sulphides with Oxygen. G. B. Fronts and O. E. Chizhikov. (107-116). [In Russian]. Value of the Coefficient k in the Formula for Determining the Weight of Representative Samples of Iron Ores. N. N. Chinkin. (153-166). The value of the proportionality coefficient k in the equation relating the weight of the representative ore sample with the diameter of the largest lumps is discussed for various conditions. Experimental results are reported. Methods of Beneficiating Krivoi Rog Iron Ores. G. I. Yudovich. (167-178). After an outline of the history and geology of the Krivoi Rog deposits, methods of beneficiating martite, magnetite and martite magnetite ores are described. Fundamentals of Sintering Ores. A. M. Pavlenov. (179-198). In this discussion of the theory of sintering the movement of water in the bed, the ignition and combustion of the fuel and the physical and chemical changes occurring at various stages of the sintering of iron ores are considered. A. Kr...

FARFENOV, A.M.

Basic problems of the sintering process. Trudy Mekhanobr no.100:3-6 '57. (MIRA 14:3)
(Sintering)

PARFENOV, A.M.

World symposium on iron ore sintering. Obog. rud 2 no. 6:76-79 '57.
(Paris--Sintering--Congresses) (MIRA 11:8)

PARFENOV, A.M.

137-1958-1-126

Translation from: Referativnyy zhurnal, Metallurgiya, 1958 Nr 1 p 19 (USSR)

AUTHOR: Parfenov, A. M

TITLE: Basic Problems of Sintering Operations (Osnovnyye voprosy aglomeratsionnogo proizvodstva)

PERIODICAL: Trudy Nauchno-issledovatel'skogo proyektnogo instituta mekhanicheskoy obrabotki poleznykh iskopayemykh, 1957 Nr 100, pp 3-6

ABSTRACT: A number of serious shortcomings in sintering operations are noted, including unsatisfactory industrial health conditions in the major units of the plants, the fact that the main structure is very high and divided into many stories, excessive stretch and inadequate width of conveyor belting. Long usage has revealed a number of defects in certain types of equipment: the 4-high fine coke crusher, the toothed clinker crusher, etc. These various shortcomings may be eliminated by the joint efforts of researchers, designers, machinery builders, and operators of the equipment. A special design bureau should be set up for this purpose, and a special plant should be assigned to the manufacture of equipment for sintering plants.

B S

Card 1/1

1. Sintering--Equipment--Operation 2. Sintering--Hazards

PARFENOV, A. M.

137-1957-12-23063

Translation from: Referativnyy zhurnal Metallurgiya, 1957, Nr 12, p 28 (USSR)

AUTHORS Parfenov, A. M., Belousova, V. T., Gulevitskaya, I. A.

TITLE: Study of the Material Composition of Fluxed Sinters of Magnetite Concentrates and of Ores from the Region of Krivoy Rog (Izucheniye veshchestvennogo sostava ofiyusovannykh aglomeratov iz krivorozhskikh rud i magnetitovykh kontsentratakh)

PERIODICAL: Tr. N.-i. i proyektn. in-ta mekhan. obrabotki poleznykh iskopayemykh, 1957, Nr 100, pp 7-28

ABSTRACT: An investigation of the properties of fluxed sinters (S) of varying basicity from the Krivoy Rog hematites and magnetite concentrates (C) (from the KYuGOK) of the following composition respectively (in percent): Fe 61 and 57, FeO 0.8 and 20, SiO_2 0.8 and 17, Al_2O_3 1.0 and 0.9, CaO 1.5 and 0.05, MgO 1.7 and 0.03. Even more than chemically the two substances differed with regard to the size of the particles. Thus, for example, the output of the sizes +3 and 1-0.6 constituted 20 and 22 percent respectively of the ore (O), whereas in the case of the C the output of the small particles of sizes 0.1-0.07 and -0.07, which were entirely absent

Card 1/3

137 1957-1 23063

Study of the Material Composition of Fluxed Sinters (cont.)

in the O, constituted 11 and 43 percent, respectively. The fluxing was accomplished by means of limestone and lime with the moduli of basicity $(CaO+MgO):(SiO_2+Al_2O_3)$ being 0.5 and 1.0. The data of these investigations show that without the addition of flux the efficiency of the sintering of the C is one-half that of O with identical mechanical properties of S. The increase of efficiency per area sintered (expressed in percent, the moduli of basicity being 0.5-1.0), when limestone was used as flux, was 134 and 137 percent for the O and 182 and 272 percent for C. The addition of lime stone considerably increases the strength of the sinter of the C, whereas the strength of the S of the O remains unaffected by it. No significant differences were found in the mineralogical compositions of the S's of O and C; the only difference between the S with limestone and the S with lime is found in the ratio of the composite substances. A considerable lowering of the temperature in the zones of sintering is observed when limestone is replaced by lime. However, this has the effect of increasing, rather than of decreasing, the strength of the S and thus points to the extensive formation of liquid phases during the process of sintering with lime. The replacement of limestone by lime results in an increase in the production of the plant. The

Card 2/3

Study of the Material Composition of Fluxed Sinters (cont.)

material composition of fluxed S's is only slightly dependent on the type and the amount of the flux added. The major factor determining the mineralogical composition of S is the chemical mineralogical composition of the raw ore.

A. M.

1. Ores-Sintering 2. Ores-Properties 3. Ores-Fluxed sinter
Determination

Card 3/3

PARFENOV, A.M.

Present state and prospects for using magnetization roasting of iron ores. Gor.zhur.no.8:17-21 Ag '56. (MLRA 9:10)

1.Mekhanobr.
(Magnetic separation of ores)

PARFENOV, Aleksandr Mikhaylovich; BAZANOV, F.M., red.; GROMOV, N.D., red. izd-va; KLEYNMAN, M.R., tekhn. red.

[Principles of the sintering of iron ores] Osnovy aglomeratsii zheleznykh rud. Izd.2., ispr. i dop. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1961. 320 p. (MIRA 14:7)

(Sintering)

PAVLOV, I. M.

212 Agloreaktsiya Zhelezhyk rud. r., Metallurgizdat, 1954. 3[illegible] . [illegible] .
4,000 Ekz. 114. 35 k V Per.--Bibliogr: V Kontse Knigi ([illegible] nazv.).-(54-54624) P
622.341:622.7[illegible]+(016.3)

SO: Knizhnaya Letopis, Vol. 1, 1955

Parfenov, A. M.

4000

AGLOMERATSIYA ZHELEZNYKH RUD

Agglomeration of Iron Ores

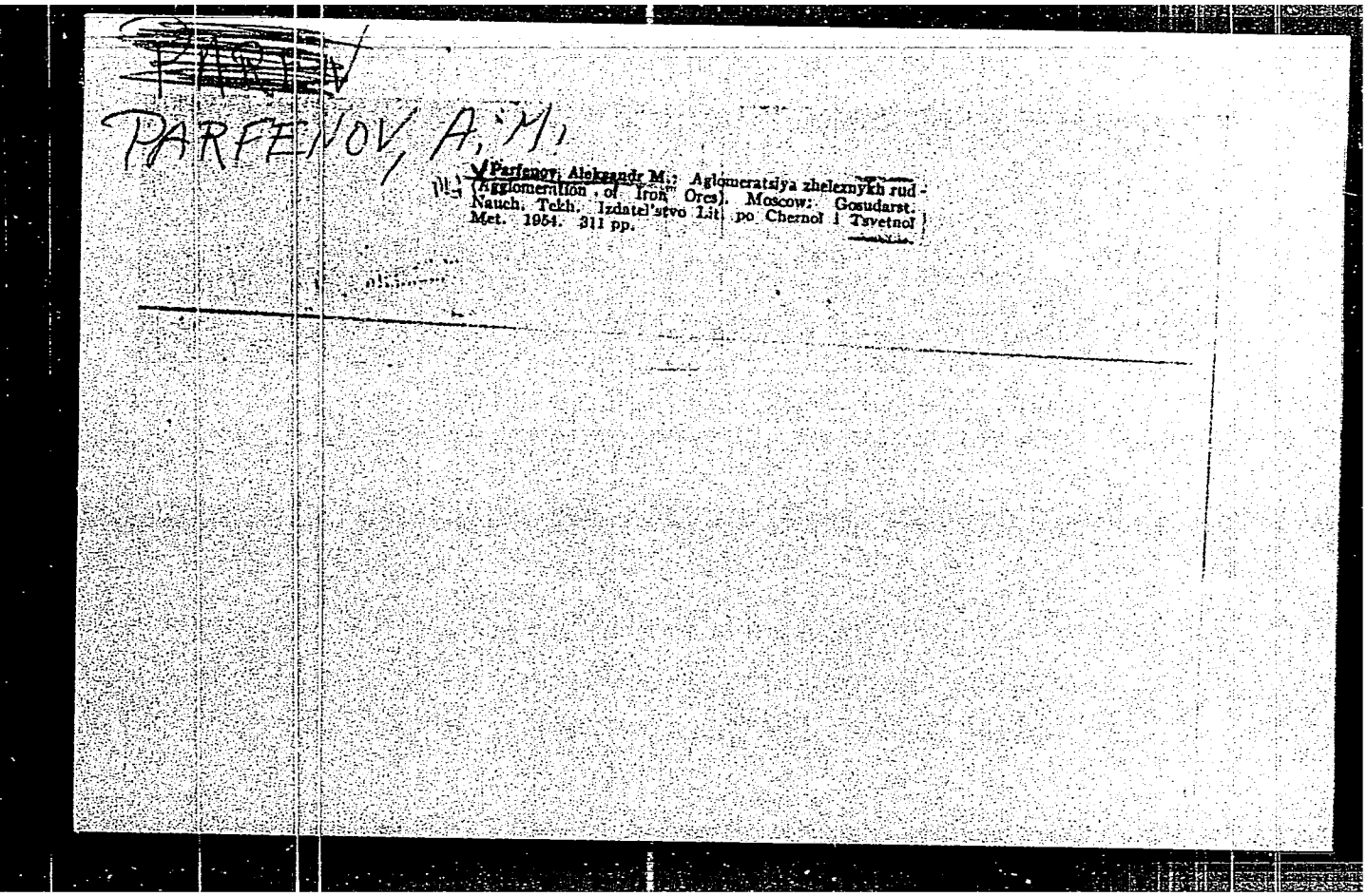
A. M. Parfenov

Published in 4000 copies
By Metallurgizdat, 1954

Ferrous Met.

In this book are given the main facts about iron ores and methods of preparing them for smelting. Methods of sintering ores are examined in detail, the theoretical bases of sintering and the evaluation of agglomerate quality are considered. The technological arrangements and the main principles for the design of sinter plants are presented.

The book is intended for engineer-technical personnel in sinter plants and can be useful to students of mining and metallurgical universities.



PARFENOV, A. M.

Parfenov, Aleksandr M.; Aglomeratsiya zhelezmykh rud - Agglomeration of Iron Ores]. Moscow: Gosudarst. Nauch. Tekh. Izdatel'stvo Lit po Chernoi i Tsvetnoi Met. 1954. 311 pp.

PARFENOV, A.M.; BELOUSOVA, V.T.; GULEVITSKAYA, I.A.

Studying the material composition of fluxed sinter prepared from Krivoy Rog magnetits concentrates. Trudy Mekhanobr no.100:7-28 '57. (MIRA 14:3)

(Krivoy Rog—Iron ores—Analysis)
(Sintering)

PARFENOV, A.M.

[Sintering iron ores] Aglomeratsiia zheleznykh rud. Moskva, Metallurgizdat, 1954. 312 p. (MLRA 8:1 D)

PARFENOV, Aleksandr Mikhaylovich

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Aglomeratsiya zheleznykh rud agglomeration of iron ores) Moskva, Metallurgizdat, 1954.
311 p. illus., diagrs., tables.
"Literatura": p. (312)

PARFENOV, Aleksandr Mikhaylovich; BAZANOV, F.M., redaktor; CHERNYAK, I.G., redaktor; MIKHAYLOVA, V.V., tekhnicheskiy redaktor

[Iron ore sintering] Aglomeratsiia zheleznykh rud. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1954. 311 p. (MLRA 8:3)
(Iron ores) (Powder metallurgy)

IONAT, Askol'd Aleksandrovich; AFANAS'YEV, K.F., dots., retsenzent; PARFENOV, A.N., dots., retsenzent; KOZLOVSKIY, S.S., dots. red.

[Solid state physics; methodological textbook for correspondence students of the Groznyi Petroleum Institute] Fizika tverdogo tela; uchebno-metodicheskoe posobie dlia studentov-zaochnikov Groznenskogo neftianogo instituta. Groznyi, Groznenskii neftianoi in-t, 1964. 113 p. (MIRA 18:3)

1. Checheno-Ingushskiy gosudarstvennyy pedinstitut (for Afanas'yev). 2. Groznenskiy neftyanoy institut (for Parfenov). 3. Kafedra fiziki Groznenskogo neftyanogo instituta (for Kozlovskiy).

PLYUSHCH, Boris Maksimovich; ROYTMAN, Mariya Vladimirovna; SARKISYAN, Vachagan Ovanesovich; ESIBYAN, Migran Aleksandrovich; Prinimali uchastiye: KLIMOVA, N.V.; EL'BIRT, M.D.; PARFENOV, A.N., dots., retsenzent; TARASOV, D.A., prof., retsenzent; AGADZHANOV, S.P., inzh., retsenzent

[Electrical equipment for oil and gas fields] Elektrooborudovanie neftianykh i gazovykh promyslov. Moskva, Nedra, 1965. 311 p. (MIRA 18:4)

1. Zaveduyushchiy kafedroy obshchey i spetsial'noy elektrotekhniki Groznenskogo neftyanogo instituta (for Parfenov). 2. Vsesoyuznyy zaochnyy politekhnicheskiy institut (for Tarasov). 3. Neftyanoye upravleniye Soveta narodnogo khozyaystva SSSR (for Agadzhanov).

SHISHKIN, Oleg Petrovich; PARFENOV, Afanasiy Nikolayevich; AKIMOV, V.F., kand. tekhn. nauk; VRONSKIY, L.N., ved. red.

[Principles of automatic control and the automation of industrial processes] Osnovy avtomatiki i avtomatizatsiia proizvodstvennykh protsessov. Moskva, Nedra, 1965. 340 p. (MIRA 18:5)

1. Gosudarstvennyy vsesoyuznyy issledovatel'skiy i proyektnyy institut neftyanoy promyshlennosti (for Akimov).

PARFENOV, A. N.

Parfenov, A. N. "The effect of a rise in voltage upon the shock of the magnetizing current when switching in transformer to no-load." Trudy Novocherkas. politekhn. in-ta im. Ordzhonikidze, Vol. XVIII, 1948, p. 25-31 - Bibliog: 5 items

SO: [illegible], 16 June [illegible], Letopis 'Zhurnal 'nykh Statey, No. 5, 1949).

[illegible], [illegible] (Engr)

Dissertation: "An electric drive of [illegible]." Cand Tech Sci, [illegible] Lenin Power Engineering Inst imeni V. M. Molotov, 29 Jun 54. ([illegible], Moscow, 14 Jun 54)

SO: [illegible], [illegible] Dec 1954

PARFENOV, Afanasiy Nikolayevich; VRONSKIY, L.N., ved. red.; VORONOVA, V.V., tekhn. red.

[Electrical equipment and electric-power supply of tank farms]Elektrooborudovanie i elektrosnabzhenie neftebaz. Moskva, Gostoptekhizdat, 1963. 223 p. (MIRA 16:5)
(Tanks--Electric equipment)

GLAZKOV, Aleksandr Nikolayevich, inzh.; PARFENOV, Afanasiy Nikolayevich, kand. tekhn. nauk; Prinimal uchastiye ANISIMOV, Sh.Ye., inzh.; VRONSKIY, L.N., ved. red.; VORONOVA, V.V., tekhn. red.

[Electric equipment for petroleum and gas refineries]Elektrooborudovanie neftegazopererabatyvaiushchikh zavodov. Moskva, Gostoptekhizdat, 1962 . 343 p. (MIRA 16:1)
(Petroleum refineries--Electric equipment)
(Automatic control)

PARFENOV, A.P.

BULGARIA/Cultivated Plants - Fruits and Berries. M-5

Abs Jour : Ref Zhur - Biol., No 3, 1958, 10984

Author : Parfenov, A.P.
Inst :
Title : A New Method of Pruning Apples.

Orig Pub : Ovoshcharstvo i gradinarstvo, 1957, No 2, 24-26

Abstract : No abstract.

Card 1/1

PARFENOV, A.P., in ; PODLIPSKAYA, V.P., inzh.; MARKOV, L.S., inzh.

Using hydrosilicate, cement, and gypsum in stabilizing soils with a high moisture content. Avt. dor. 23 no.10:10-12 O '60. (MIRA 13:10)

(Soil stabilization)

CHERKASOV, I.I., prof.; PARFENOV, A.P.

Stabilizing saturated soils by carbamide resins. Avt.dor. 24 no. 2:18 F '61. (MIRA 14:3)

(Soil stabilization)

MARKOV, Lev Alekseyevich, kand. tekhn. nauk; PARFENOV, Anatoliy Pavlovich, inzh.; PUGACHEV, Boris Vasil'yevich, kand. tekhn. nauk; CHERKASOV, Igor' Ivanovich, doktor tekhn. nauk, prof.; YEGOZOV, V.P., red.; BODANOVA, A.P., tekhn. red.

[Improving soil properties by the use of surface active agents and aggregating materials] Uluchshenie svoistv gruntov poverkhnostnoaktivnymi i strukturoobrazuiushchimi veshchestvami. Pod red. I.I.Cherkasova. Moskva, Avtotransizdat, 1963. 175 p. (MIRA 16:6)
(Soil stabilization) (Road construction)

SURMELI, D.D., kand.tekhn.nauk; PARFENOV, A.P., inzh.

Bituminous binding materials made with reclaimed rubber.
Avt.dor. 23 no.6:19-20 Je '60. (MIRA 13:6)
(Rubber, Reclaimed) (Binding materials)

PASHKOV, V.Ye.; PARFENOV, A.P.; SOLOV'YEV, V.A.; ORLOV, A.I.

Selection of the optimum magnitude of the pressure area in NSh-32 and NSh-46 gear pumps. Trakt. i sel'khozmash. 32 no.6:14-15 Je '62. (MIRA 15:6)

1. Moskovskiy zavod gidroagregatov.
(Tractors--Equipment and supplies)

PARFENOV, A. P.

PA 7/49T71

USSR/Medicine - Tuberculin May/Jun 48
Medicine - Tuberculin Therapy

"Electrophoresis of Tuberculin," A. P. Parfenov, B. I. Sinel'nikova, Cand Med Sci, Leningrad Tuberculosis Inst, 3½ pp

"Problemy Tuberkuleza" No 3 - p. 480-3

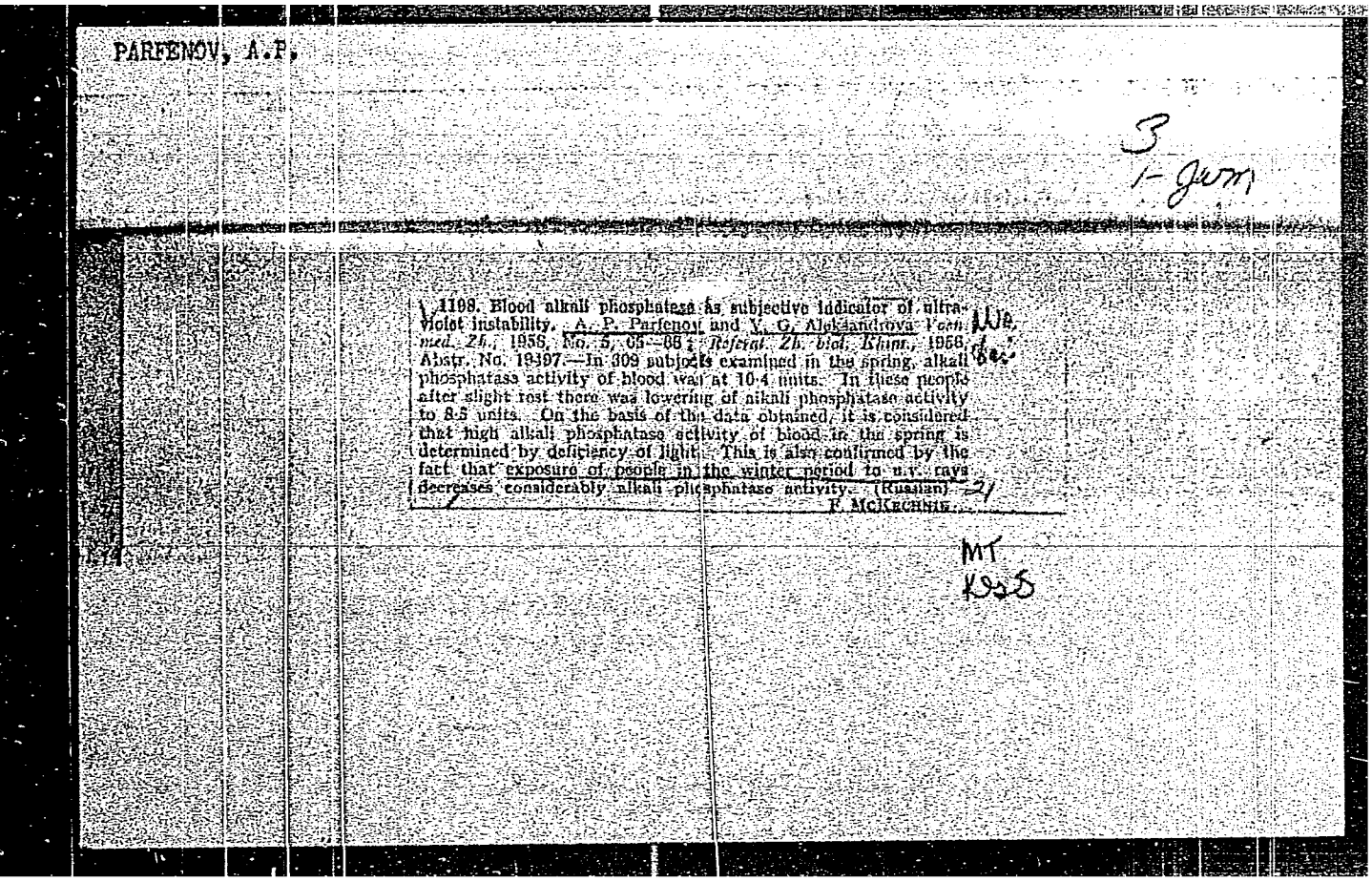
Tuberculin contains two albumen fractions of different molecular weights (16,000 and 32,000). The high fraction is antigenic. Activity is increased by electric current (6 - 20 mA for 40 minutes). Describes administration of tuberculin by electrophoresis. Summarizes results of 86 cases.

7/49T71

PARFENOV, A.P., MOLCHANOV, Ye.V.

Effect of condensation field of ultra high frequency waves of barrier properties of live tissues. Klin.med., Moskva no.4: 84-86 Ap '50. (CLML 19:3)

1. Of the Department of General Physiotherapy and Health Resort Therapy (Head -- Prof. A.P.Parfenov) of the Naval Medical Academy, Leningrad.



PARFENOV, A.P.

3
1-Germ

4198. Blood alkali phosphatase as subjective indicator of ultra-violet instability. A. P. Parfenov and V. G. Aleksandrova *Vest. klin. med.* 24., 1956, No. 5, 65–68; *Referat. Zh. biol. Khim.*, 1956, Abstr. No. 19397.—In 309 subjects examined in the spring, alkali phosphatase activity of blood was at 10·4 units. In these people after slight rest there was lowering of alkali phosphatase activity to 8·5 units. On the basis of the data obtained, it is considered that high alkali phosphatase activity of blood in the spring is determined by deficiency of light. This is also confirmed by the fact that exposure of people in the winter period to u.v. rays decreases considerably alkali phosphatase activity. (Russian) 2/

F. McKechnie.

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STRUCHKOV, V.I.(Moskva, Truzhennikov, per., d.19, kv. 37); SKRIPNICHENKO, D.F.; FEDOROV, B.P.; PARFENOV, A.P.

Changes in cardiovascular activity during and after radical surgery of the lungs [with summary in English p.159] Vest.khir. 77 no.7:64-70 Jl '56. (MLRA 9:10)

1. Iz kafedry obshchey khirurgii lechebnogo fakul'teta (zav. - prof. V.I.Struchkov) 1-go Moskovskogo ordena Lenina meditsinskogo instituta
(LUNGS, surg.
perop. & postop. changes in cardiovascular. activity)
(CARDIOVASCULAR SYSTEM, physiol.
perop. & postop. changes in lung surg.)

PARFENOV, A.P.

Skin anesthesia by administrating anesthetics by direct current. Vop.kur.fizioter. i lech.fiz.kul't. 21 no.4:83-87 O-D '56. (MLRA 9:12)

1. Nachal'nik kafedry fizioterapii i kurortologii Voyenno-morskoy meditsinskoy akademii.

(ELECTROPHORESIS) (LOCAL ANESTHESIA)

PARFENOV, A.P.; ALEKSANDROVA, V.G. (Leningrad)

Elimination of radioactive phosphorus from the body with the aid of direct current. Vop.kur.fizioter. i lech.fiz.kul't. 22 no.6: 25-29 N-D '57. (MIRA 11:2)
(ELECTROTHERAPEUTICS) (PHOSPHORUS--ISOTOPES)

PARFENOV, A.P.

Electrocardiographic changes during lung surgery. Khirurgiia 34 no.3: 81-86 Mr '58. (MIRA 12:1)

1. Iz kafedry obshchey khirurgii lechebnogo fakul'teta i Moskovskogo ordena Lenina meditsinskogo instituta (dir. - prof. V.I. Struchkov) na baze bol'nitsy No.23 im. Medsantrud (glavnyy vrach A.P. Timofeyeva).
(LUNGS, surg.
ECG changes (Rus))
(ELECTROCARDIOGRAPHY
in lung surg., changes (Rus))